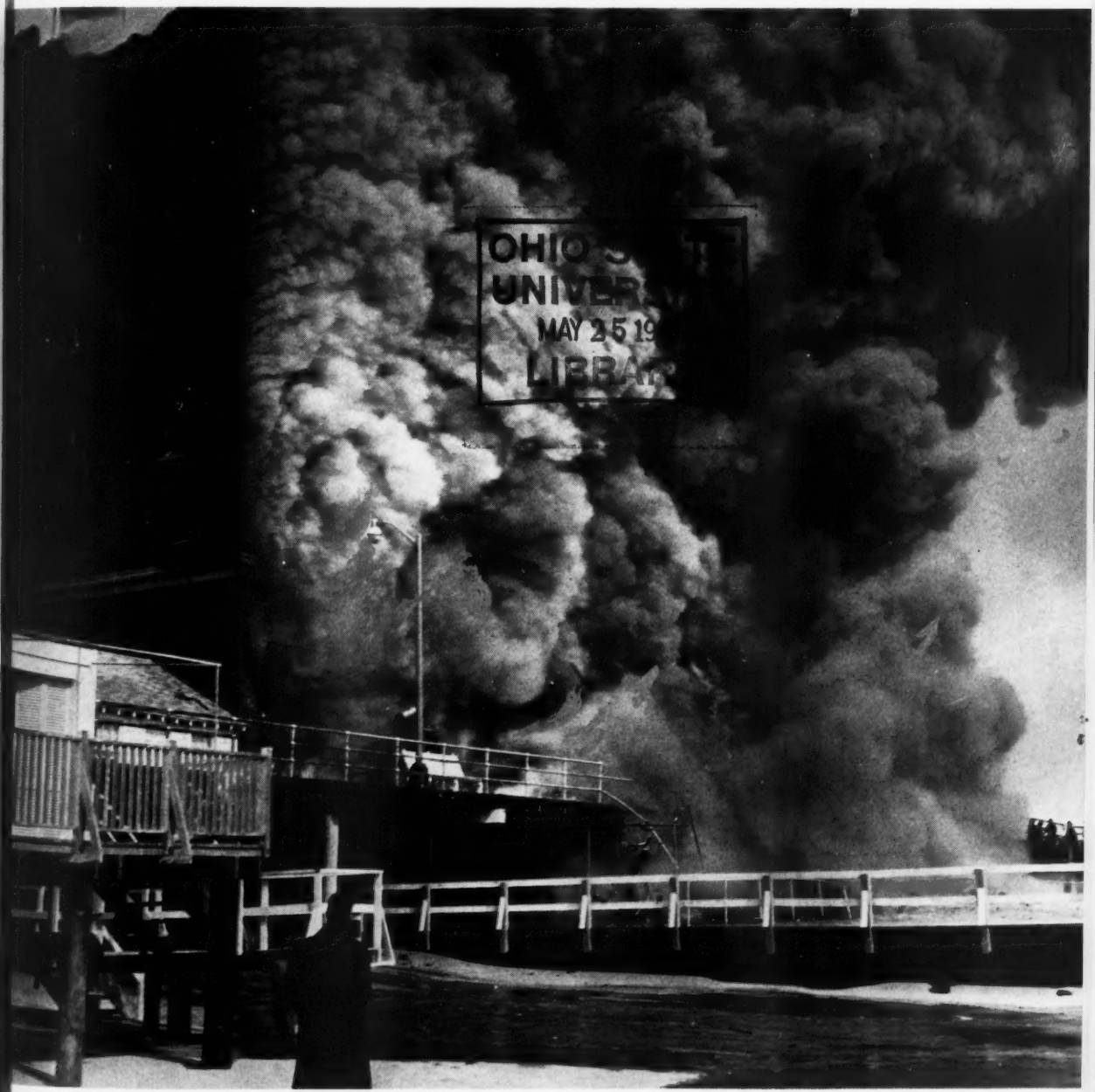
FIRE ENGINEERING

MAY
1960

The Journal of the Fire Protection Profession Since 1877

A Reuben H. Donnelley Publication



OHIO
UNIVER
MAY 25 19
LIBRA

Nautilus Hotel fire at Atlantic Beach, New York, on March 14 resulted in first use of New York-Nassau County mutual aid plan **(see story page 398)**

IMPACT PROTECTION!

Heavy, flaming debris smashing over fire fighters' heads is among hazards that top the list of most frequent fire department injuries.

Knowing this, it's easy to see why our engineers have designed HARDBOILED® fire helmets to insure maximum impact protection, with minimum impact transmission. Even when exposed to temperatures as low as − 60° F. or as high as + 2,400° F., these tough fiber-glass shells surpass Federal and State Specifications for head protection. Yet, complete with either POWER-BLOC® or standard suspension, they weigh only 22 ounces.

We can safely say, "Bullard fire helmets are the best impact protection a fireman can use. Try it and you'll see that no fire helmet surpasses Bullard...in comfort, safety and economy."

Write for fire department catalog.

BULLARD
INDUSTRIAL SAFETY EQUIPMENT

E. D. BULLARD COMPANY • SAUSALITO, CALIFORNIA • THE 3 RIDGES FORM A BULLARD TRADE MARK, REG. U. S. PAT. OFF.

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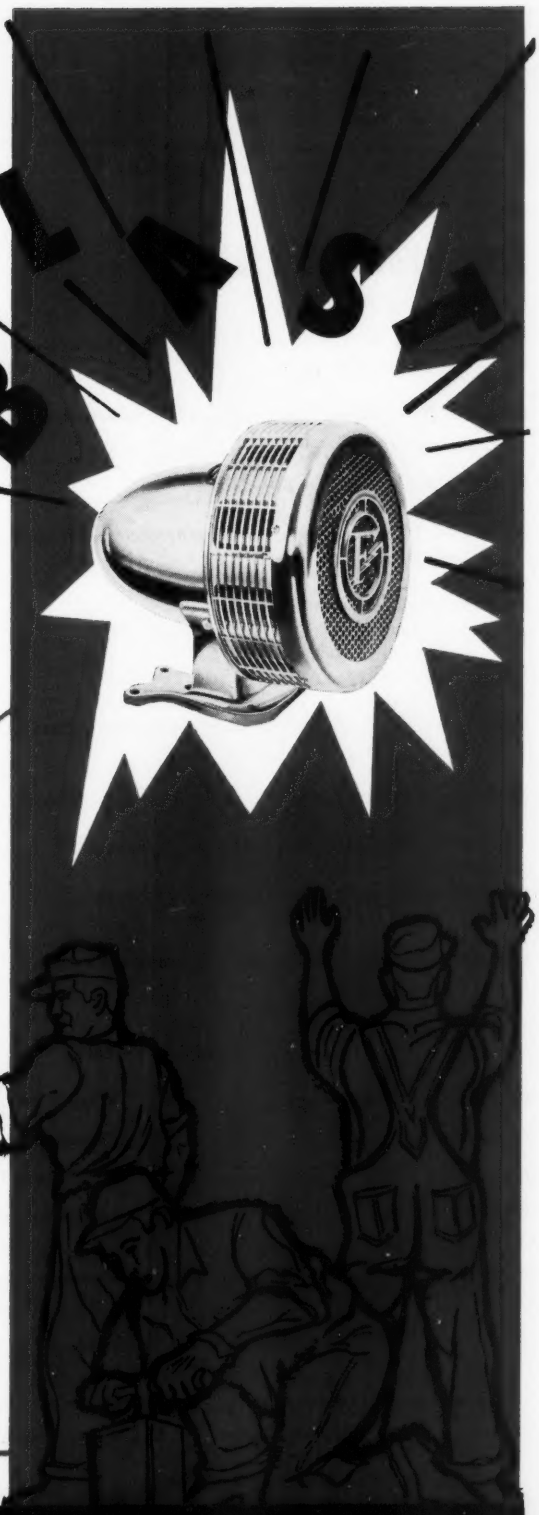
SET OFF A BLAST



Moving some obstacles requires dynamite or its equal. Blasting is good engineering. It's a time and man saver. Our suggested blast isn't dangerous; in fact it's a safety factor— *a life saver!*

When you encounter immovable objects in traffic, give 'em a blast on your siren. It's the only way to rouse some dreaming drivers or pedestrians. You can't rely on lights alone. Some people just don't see them. Use Dynamite!!

The FEDERAL Class Q or C Coaster sirens are dynamite; they pack the dynamite sound that blasts modern traffic. Ask for catalog #300 today and be sure to specify FEDERAL Class Q or C siren on your new apparatus.

FEDERAL SIGN and
SIGNAL Corporation

13602 S. Western Ave., Blue Island, Ill.

FIRE
ENGINEERING

VOL. 113 MAY, 1960 NO. 5

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Symbol of Service

The above symbol commemorates 75 years of service to business and professional communication by The Reuben H. Donnelley Corporation, publisher of FIRE ENGINEERING through its Magazine Publishing Division.

Active in telephone directory sales and publishing, in direct mail, merchandising and other functions as well as magazines and professional journal publishing, the Donnelley name has come to be accepted as representing the very highest standards of service and integrity in these varied fields of endeavor.

This anniversary emblem is our continuing guarantee of dedicated service to ourselves, based on the highest standards of publishing ethics and a 75-year-long company tradition of worthwhile values, objectives and achievements.

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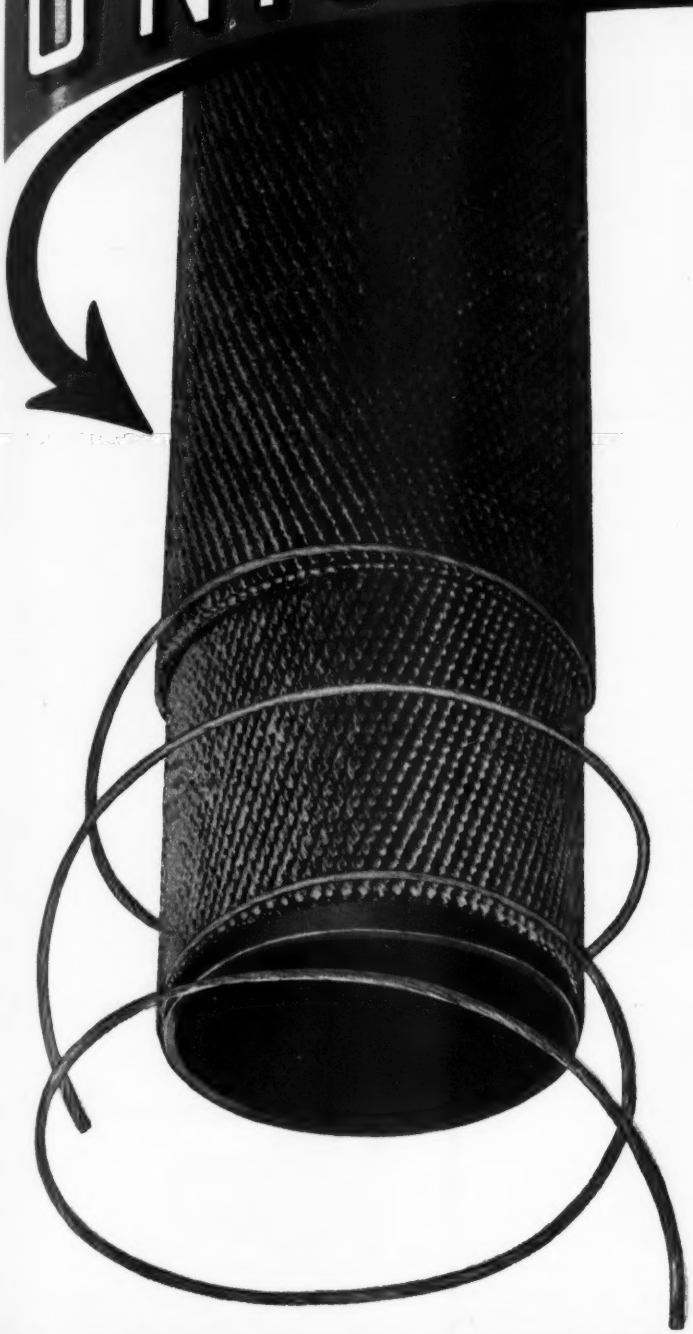
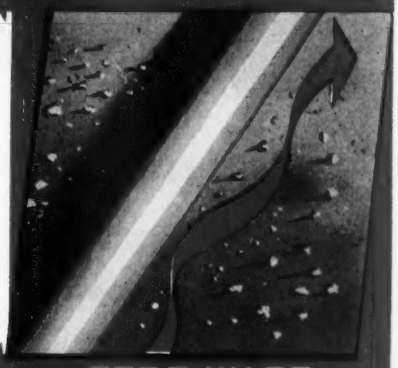
UNISPUN FIRE HOSE



ZERO TURNS



ZERO WARP

ZERO RISE

WRITE US OR CONTACT
YOUR AUTHORIZED
FABRIC FIRE HOSE
REPRESENTATIVE

WITH WEATHERMATE PROTECTION AND PRES-R-LOCK COUPLINGS

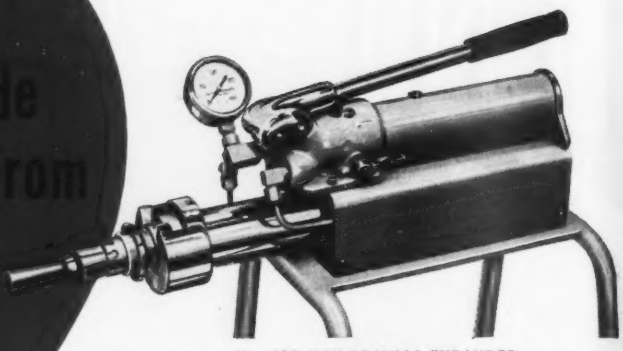
FABRIC FIRE HOSE COMPANY ★ SANDY HOOK, CONN.

Exclusive Manufacturers of Fire Hose Since 1869 ★★★★★

IN CANADA *Pierre Thibault* CANADA, LTD., LTEE., PIERREVILLE, QUEBEC

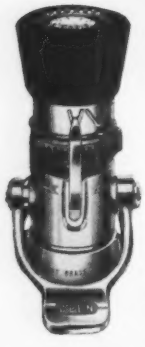
A matter of pride in every product from

ELKHART BRASS



No. 422 HAN-DRAULIC EXPANDER

Attaches expansion ring coupling by hydraulic pressure. Has individual size segments. Quick change.

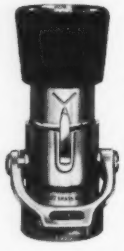


No. SFL-200-SOS

SELECT-O-FLOW
CONSTANT FLOW MYSTERY NOZZLE

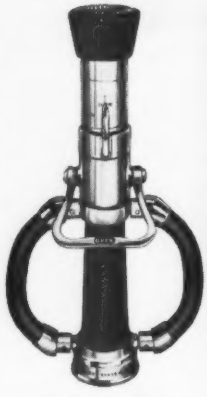
Will handle variable gallonage from 60 to 125 G.P.M. at 100 p.s.i. Change gallonage without shutting down line. All fog patterns and straight stream. Underwriters' approved.

Whether it's a valve, a spanner, an extinguisher, a Mystery nozzle, coupling or any one of more than 3000 items produced by Elkhart—our stamp of pride and your proof of quality is the famous Heart and Elk trade mark—made by Elkhart Brass.



SELECT-O-STREAM MYSTERY NOZZLES

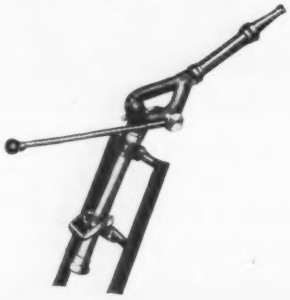
In 1", 1½", 2½" sizes. Select stream by sight or touch. Locks to stream you choose. Shuts off in any position. From straight stream through 30° to 90° fog pattern.



No. B-800 SOS

New! Improved! Exclusive Dial-A-Tip feature gives a variable straight stream equivalent to straight tips from ⅜" to 1⅛". Has 30°, 60°, 90° fog positions.

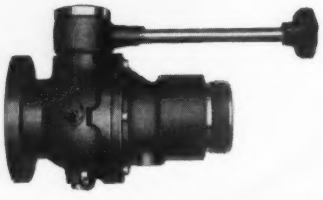
No. 288 LADDER PIPE



Handles the full capacity of a 3" supply line. Quick action clamping device. Operates both vertically and horizontally. Available with 2½" or 3" swivel inlet. Supplied with set of ropes for ground operation.

No. X-329 X-TRUDE COUPLING

For 1½" and 2½" single or double jacket fire hose. Non-corrosive, forged brass coupling approximately one-half the weight but considerably stronger than a cast coupling.



No. BT96 2½" APPARATUS VALVE

Has adjustment feature on outlet side of valve. New twist-to-lock quarter turn handle. Holds vacuum or pressure. Full waterway.

ELKHART BRASS MFG. CO., INC.
ELKHART, INDIANA
More than half a century of fire fighting progress

This hose fights fires long after ordinary hose gives up

NOT one single length of this hose has ever failed at the coupling. It's lighter, more flexible—yet is as strong as heavier, bulkier hose. It's protected against mildew. These quality features of B.F.Goodrich hose may add a few cents per foot to its cost, but they're worth so much more.

For example, Plylock end protection, an extra layer of hardwoven cords extending 12″ from the coupling, adds 100% more strength to the coupling area. It prevents the tube from splitting or cracking during the strain of coupling or uncoupling hose to hydrant, greatly increases hose life.

The hose gets its lightness and flexibility from "filler" cords of Dacron fiber which go around the hose and carry the load under pressure. These cords are thinner, and three times stronger than cords used in ordinary hose. Because of this reinforcement, the hose not only lasts longer, but it's easier to handle, and coils tighter so that hundreds of extra feet can be racked on a truck.

Superseal is a special treatment that practically eliminates mildew as a hose killer. This exclusive B.F.Goodrich treatment for hose gives 10 times more resistance to mildew and rotting than ordinary treatment. It also protects against moisture absorption and freezing, and increases the hose's resistance to fire.

If you're looking for a good buy in hose, get the B.F.Goodrich fire hose with all these quality features. It may cost more to begin with, but will actually cost you less in the long run. Your B.F.Goodrich distributor can tell you more about it. *B.F.Goodrich Industrial Products Company, Dept. M-828, Akron 18, Ohio.*

B.F.Goodrich *fire hose*

ORIGINAL

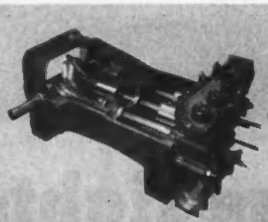
Within thirty seconds—three quick operations—and you're in action with John Bean High Pressure Fog Firefighters. Just engage the pump, open the valve, adjust the throttle for RPM and the hose lines are ready. This kind of speed for fast fire attack adds hard-hitting, fire-killing power to any department, metropolitan or rural. With John Bean Original High Pressure Fog apparatus, you can extinguish more than 95% of your fires faster, use 10% or less of the water usually required, and do it with greater safety, with little water damage.

HIGH PRESSURE FOG FIGHTS FIRES FASTER WITH A 3-WAY PUNCH . . .

1 IT COOLS—As it contacts a fire, John Bean High Pressure Fog instantaneously absorbs heat at the rate of approximately 280,000 BTU per gun, per minute, and reduces the temperature below the kindling point.

2 IT SMOTHERS—By reducing the oxygen supply. As the super fine fog particles absorb heat, they expand 1700 times to form a smothering blanket that displaces the combustion-supporting oxygen.

3 IT ISOLATES—By throwing a barrier of "cold steam" between the burning gases and their source of fuel.



FAMOUS John BEAN HIGH PRESSURE PUMP

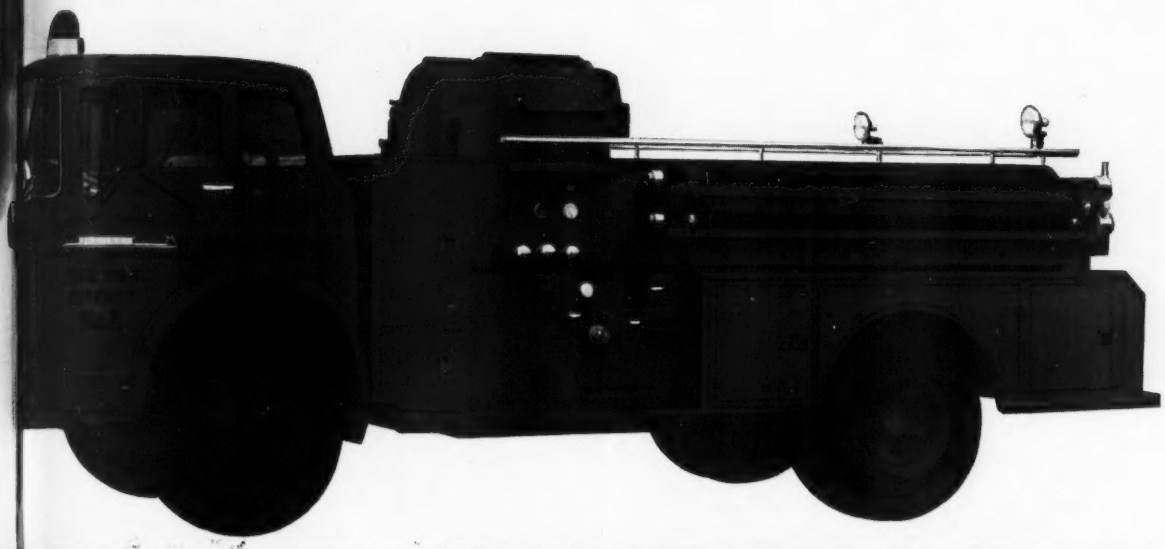
The original, true high pressure fog pump operates at 850 psi, delivers 60 gpm through two hose lines. Self-priming, it can be supplied from tank, hydrant or draft source. Rugged and dependable, the fully enclosed pump features oil bath lubrication, forged steel crankshaft and double-sealing plunger packings for maximum efficiency.

PATENTED FOG GUN

Easily operated by one man, this famous gun features instant, on-off trigger action with face-protecting spray for close approach. Rotating barrel permits quick selection of complete range of fog patterns from close-up spray to long range fog.

FOR PROOF OF John BEAN FIREFIGHTER EFFECTIVENESS, WRITE TODAY FOR A DEMONSTRATION

John BEAN HIGH PRESSURE FOG FIREFIGHTERS for hard-hitting, fire-killing power



ENCLOSED, HEATED REEL COMPARTMENTS

Removable enclosures winterize the two reel compartments. These, as well as pump, valves, gauges and controls are warmed by engine heat to assure dependability in freezing weather.

500-GALLON WATER TANK

Big, 500-gallon tank supplies water for high pressure fog lines. Water, discharged as high pressure fog, is increased by a 10 to 1 ratio, makes the 500 gallons go ten times further. Six-compartment baffling prevents undesirable water surge, assures smooth cornering.

LIGHTED CONTROL PANEL

All gauges, valves and controls are centralized for instant operation. Entire panel is illuminated for quick, easy reading at night.

POWER TAKE-OFF FOR IN-MOTION PUMPING

High pressure pump has its own power take-off coupled to the engine so that fog lines can be operated while truck is in motion for fighting grass, brush and forest fires. Pump control is located conveniently in the cab.

400-FT. HIGH PRESSURE HOSE

Standard equipment includes two, 200-ft. reels of special, 5000 psi hose, plus two 10-ft. lengths of 2½-inch hard suction hose, complete with suction strainer.

AMPLE STORAGE CAPACITY

Four, large-size, fully lighted compartments provide more than 45 cubic feet of storage space for accessory equipment. Flush-type door latches for easy opening.

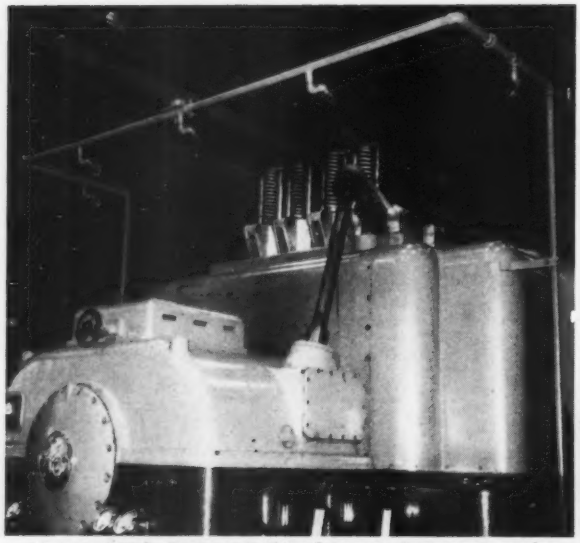
THE **ORIGINAL** *HIGH PRESSURE FOG*

IN YOUR COMMUNITY

John BEAN®

DIVISION OF
FOOD MACHINERY AND CHEMICAL CORPORATION
LANSING, MICHIGAN — SAN JOSE, CALIFORNIA ®

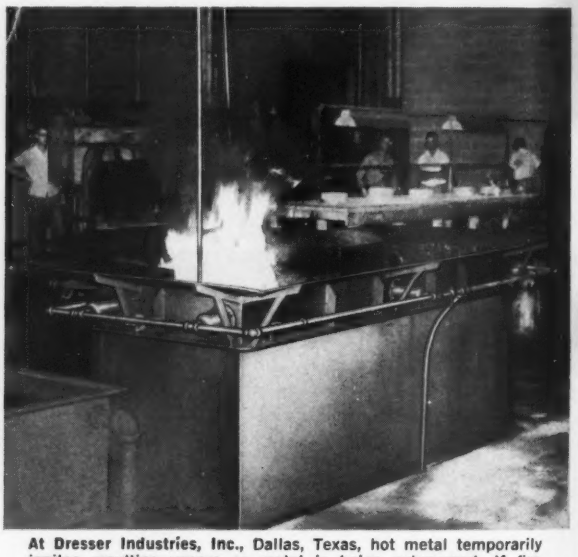
fmc



At Pennsylvania Power and Light Company, Sunbury, Pa., this steam generator is protected by an automatic Grinnell Protecto-Spray system in the event of outside fires and by a Dry Chemical system inside the casing.

At Canadian Vegetable Oil Processing Ltd., Hamilton, Ontario, Grinnell ProtectoSpray safeguards upper structure of this hexane solvent extraction unit, while a ProtectoFoam system guards the lower section.

At the RCAF supply depot at Namao, Alberta, this infrared drying oven is protected by a Dry Chemical system engineered by Grinnell to protect against possible fire resulting from ignition of flammable vapor mixtures.



At Dresser Industries, Inc., Dallas, Texas, hot metal temporarily ignites resulting vapors as metal is being submerged. If fire should get out of control, a Grinnell-installed Carbon Dioxide system is on guard to extinguish it quickly.

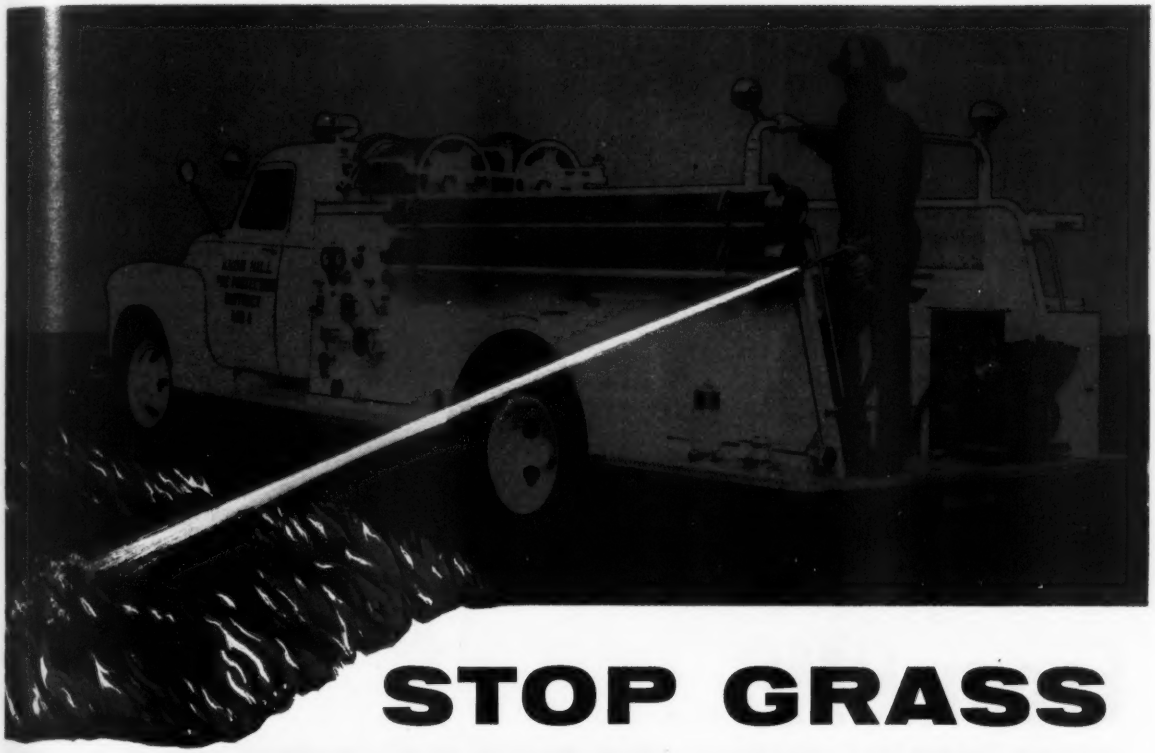
You can rely on Grinnell for the right protection against destruction by fire!

Grinnell has had 90 years experience in devising fire protection systems for all kinds of fire hazards — systems which can be relied on to protect the continuity of business and to safeguard dollars invested. Grinnell offers quality-controlled manufacturing, layouts by experienced engineers, and installations by skilled crews. Let Grinnell engineers help you select the right system.

16 mm. Sound-Color Film — Get up to date on fire with Grinnell's 35-minute film — "Fire Protection Through Research." Both typical and unusual fire hazards are described and demonstrated. To borrow this film, without charge, write — Grinnell Company, Providence 1, Rhode Island.

GRINNELL

FIRE PROTECTION SYSTEMS SINCE 1870



STOP GRASS BLAZES QUICK!

Used as mobile pump, booster, or to pump out basements. Supplies two 1½" hose lines with ½" nozzles, or one 2½" line with ¾" nozzle. Handles dirty water without serious damage. Engine available with Automatic Starter if desired.

* *Remember, the 3XD Portable always provides constant pump pressure regardless of road speed when pumping "on the move".*

Get an American Fire Pump

3 X D PORTABLE

Will your phone "ring busy" when summer dry spells hit? Be ready for grass and brush blazes with this handy, power-packed 3XD Portable!

With it, you can fight wind-whipped fires *on the move** . . . get them controlled fast! Then, use it as an auxiliary to draft water from ponds to refill your tank. Or carry it down a river bank to get water your truck can't reach.

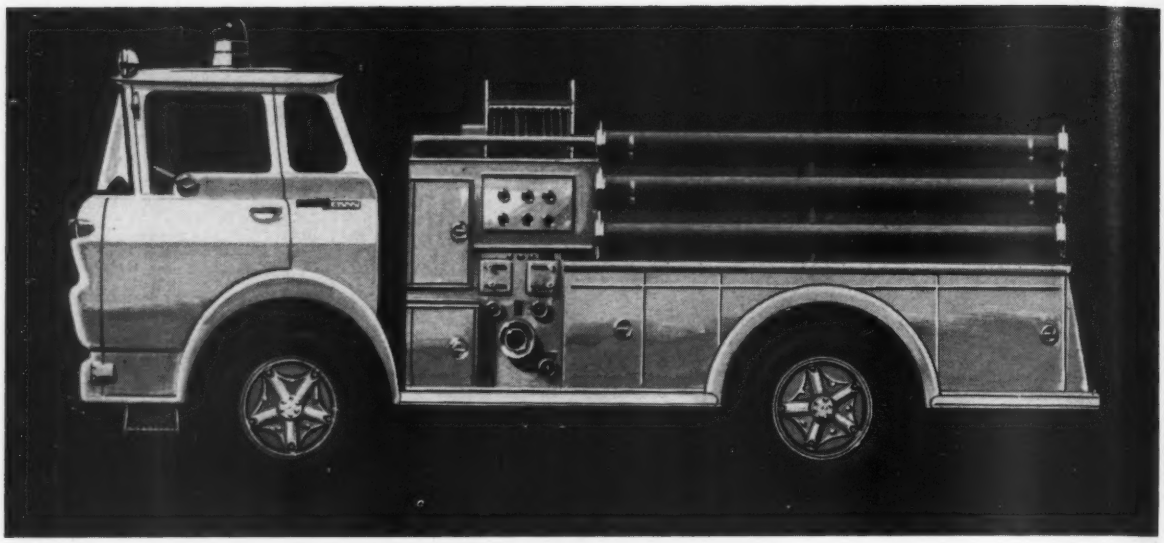
After a building fire, leave it to pump out the basement while your pumper returns to the station. Let it handle dirty water when necessary — and protect your larger pump.

For extra mobility, capacity and usefulness, you'll find the American 3XD Auxiliary Portable truly valuable . . . yet low in cost!

WRITE TODAY FOR BULLETIN 8120.

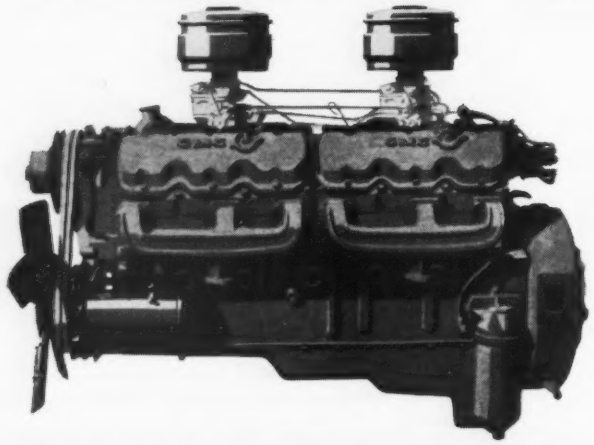
★ AMERICAN ★
FIRE PUMP COMPANY

P. O. BOX 219-A BATTLE CREEK, MICHIGAN



This is the new GMC L7000 Series steel tilt-cab powered by exclusive 12-cylinder, 702 cubic-inch Twin-Six.

From GMC... HIGHER PERFORMANCE, MORE DEPENDABLE FIRE ENGINES!



- Full 299 hp. at just 3000 rpm.
- Pump up to 1500 gallons per minute.
- Faster take-offs with plenty of reserve power.
- Shifting greatly reduced.
- Easier driving with shorter turns.
- Safer, all-round vision.
- Quick, easy entry and exit.

V-6 **New, exclusive, extended-life V-6 engines—only from GMC!** Fast starting, new GMC V-6s give you top usable power at low engine speeds for responsive acceleration and dependable, high performance.

GMC V-6 and Twin-Six engines meet all the power requirements for 500 to 1500 gallons per minute . . . 90" and 105" Conventional and 72" Steel Tilt-Cabs.

GMC
GENERAL MOTORS CORPORATION
TRUCKS

GMC Truck & Coach—a General Motors Division—Pontiac, Michigan

Make Your Equipment Completely Modern, With

GOODALL "EZflex" FM

The Stronger, Lighter Fire Hose . . . in 100 Foot Lengths

Basic "Fire-Flex" construction . . . a combination of materials and methods of manufacture which has revolutionized the entire fire hose field. Far superior to old-style hose in ease of handling, convenience in storing, and long service life.

Cutaway view shows construction, including *full-length* reinforced tube with much higher burst pressure than conventional hose and a jacket providing unequalled resistance to abrasion and puncturing.

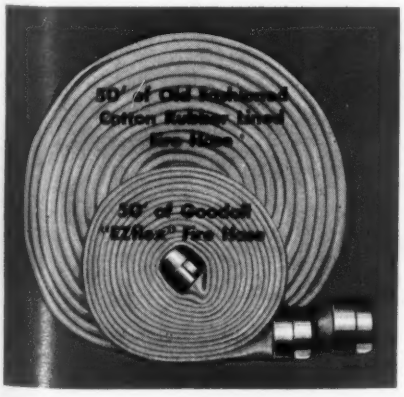
300 LB. TEST—SINGLE JACKET
400 LB. TEST—DOUBLE JACKET

Can also be furnished in 600 Lb. Test—Double Jacket

Mildew treated at no extra cost

U.S. Pat. No. 2392967

Contact Our Nearest Branch for Details and Prices



COMPARE THE BULK! Illustration at left shows vast difference in coil compactness of "EZflex" compared with old-style Cotton Rubber Lined.

COMPARE THE WEIGHT! A 50 ft. coil of 2" "EZflex", Single Jacket, uncoupled, weighs only 14½ lbs. Check *this* against the weight of the old-fashioned hose you may still be carrying.

Standard of Quality—Since 1870

HOSE · BELTING · FOOTWEAR · CLOTHING
AND OTHER INDUSTRIAL RUBBER PRODUCTS

GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

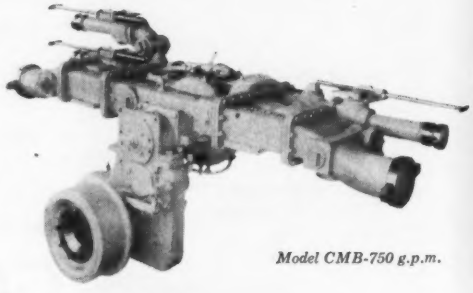
BRANCHES AND DISTRIBUTORS THROUGHOUT THE UNITED STATES.
IN CANADA: GOODALL RUBBER CO. OF CANADA LTD., TORONTO.

WATEROUS MEANS *hair-splitting quality*

The dependability of WATEROUS fire pumps is assured by holding tolerances of 1/10,000 of an inch or less on gears and other vital pump components; that's equivalent to splitting a human hair thirty ways!

Here a skilled WATEROUS craftsman performs one of several inspections on the helical gear of a Model CM pump. Precision crown-shaving of constant-mesh helical gears eliminates noise associated with more common spur gears.

Precision fire pump building and testing by WATEROUS means quality-smooth operation and much longer life.



Model CMB-750 g.p.m.

Waterous DEPENDABLE SINCE 1886

For more information about dependable WATEROUS fire pumps, write:

WATEROUS COMPANY

80 East Fillmore Ave., St. Paul 7, Minnesota, Dept. 3F12

Fyr-Fyter

offers you these Fire Department products

...and 1174 more!

Your largest single source for all municipal, industrial and commercial fire department equipment is Fyr-Fyter, with more than 1200 different items to select from! To name only a few of these high-quality products, the complete Fyr-Fyter line includes approved fire hose, Wooster brass goods, nozzles and couplings, portable fire extinguishers, clothing, pumps, ladders, warning and signaling devices, first-aid kits, masks, breathing apparatus, fire alarms, etc. Your Fyr-Fyter representative is thoroughly trained and experienced in fire department problems . . . can offer valuable counsel and make equipment recommendations without prejudice. With Fyr-Fyter as your single source of supply, you place one order and pay one bill, thereby eliminating the complicated paper work involved in dealing with many suppliers. Write today for free catalog describing 1200 items to The Fyr-Fyter Company, Dayton 1, Ohio.

products of THE FYR-FYTER COMPANY

Branches: Atlanta, Baltimore, Boston, Chicago, Dallas, Dayton, Detroit, Los Angeles, New York, Newark, Philadelphia, Pittsburgh, Portland, Rochester, San Francisco, Toronto (Ontario). Representatives and Distributors in all principal cities.

The greatest life-saving advancements come from DIVCO

The new DIVCO/M-M Emergency Rescue Vehicle

the rescue truck designed by rescue squads

Every inch a lifesaver, the Divco/M-M Emergency Rescue Vehicle fulfills your need for specialized equipment capable of holding 12 men or five stretchers with a huge cabinet space of more than 120 cubic feet for additional equipment storage.

A forward-control van type vehicle offering excellent maneuverability in tight places and great visibility, the new Divco/M-M Emergency Rescue Vehicle rides on the famous Divco rugged, multi-stop chassis, proved in more than three billion miles of operation.

Road speeds in excess of 60 MPH are attained from the 6-cylinder overhead valve 114 HP engine. Total weight with standard equipment is 8,400 pounds with a gross vehicle weight up to 14,000 pounds.

The Divco/M-M Emergency Rescue Vehicle can be built to your specifications within the many available Divco Chassis and Body Shells—MM interiors and equipment options.

Contact your Divco or Miller-Meteor Distributor today for complete details.

Rear platform extends a full 16 inches, features four-way non-slip tread steel plate. Chromed safety hand rails are provided both right and left as well as above rear door. Rear step (optional equipment) folds back under platform. Optional work lights on top of truck feature swivel base.

Interior view shows roomy 26-inch aisleway of four-way steel tread. Included are electric power exhaust ventilator, hanger rails, eight-inch house lights (110 v.), fold-away stretcher brackets shown in folded position, standing cabinets with shelves, underseat cabinets to hold stretchers and 15,000 BTU gasoline heater that runs independently of truck motor.

DIVCO

DW

DIVCO TRUCK DIVISION · 22000 Hoover Road · Detroit 5, Michigan

DIVCO-WAYNE CORPORATION · AMERICA'S NO. 1 TRANSPORTATION SPECIALISTS

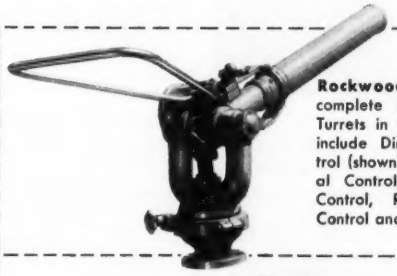
Stop Highway Fires!

The only way you can prevent highway fires from becoming major disasters in your community is to put them out as quickly as possible. Rockwood fire fighting products bring you that positive protection.

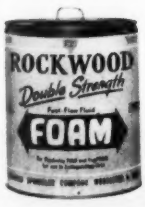
- **Using Rockwood nozzles or turrets, on fire trucks or on the ground, you can hit fires harder.**
- **Using Rockwood FOAM liquid, single or double strength, you can throw a quickly smothering blanket over fires in flammable fluids and other combustibles.**

Rockwood nozzles and turrets fight fires four ways: with solid water stream, solid FOAM stream, FogFOAM and WaterFOG. For over half a century, throughout the country, Rockwood's highly advanced fire fighting aids have been proving their ability to save lives and property. Make sure your own department has these dependable tools. For a large, illustrated booklet on this complete line, write to Rockwood Sprinkler Company, Portable Fire Protection Division, 451 Harlow Street, Worcester 5, Massachusetts.

SG-60 Nozzle with FF Extension. Like all Rockwood Nozzles and Turrets, this discharges straight water stream or WaterFOG, solid FOAM stream or FogFOAM.



Rockwood makes the most complete line of Specialty Turrets in the market. Types include Direct Manual Control (shown), Extended Manual Control, Remote Manual Control, Remote Hydraulic Control and Portable.



Rockwood Double Strength FOAM Liquid is mixed 3 parts with 97 parts water. This forms a blanket with proved ability to extinguish fires in flammable liquids with maximum speed and safety.

BLISS ROCKWOOD

ROCKWOOD SPRINKLER COMPANY

Engineers Water . . . to cut fire losses

A Division of The Gamewell Company
Subsidiary of E. W. Bliss Company
Distributors in all principal cities

MIDWESTERN

Safety Clothing for Firemen

The Original STRIPED SAFETY COAT

The striped safety coat for firemen is an Original Midwestern development — first in the field — a leader ever since its introduction 19 years ago.

The BRILLIANT YELLOW stripes are actually rubberized into the black rubber . . . an exclusive feature that defies comparison with substitute or imitation models where the stripes are glued, sewed or painted on the material.

When working under hazardous conditions in smoke, fog, dust or darkness, firemen deserve the superior quality, design, comfort and safety features offered by the Original Midwestern Safety Coat.

Many Fire Chiefs who insist on the best of protection for the men of their department specify MIDWESTERN SAFETY garments to the last man because every outstanding Midwestern feature is original. All fabrics are extremely soft and flexible and have the qualities to stay that way at varying temperatures. You can always distinguish a MIDWESTERN SAFETY garment by the soft feeling of the material in both rubber and fabric type garments.

We have always designed and constructed our garments with the one thought . . . that every fireman deserves complete protection in his hazardous work of protecting life and property against the ravages of fire.

COMBINATION BUNKER SUITS

The many weights of both rubber coated and cloth type materials offered in our MIDWESTERN Quick-Hitch suit makes this combination ideal for all sections of the domestic market and export. Also, both coat and bunker pants may be purchased with or without detachable wool linings.

MIDWESTERN SAFETY MANUFACTURING CO.
Mackinaw, Illinois

☐ Have Midwestern representative call with complete information and prices.

☐ Send Free Catalog and fabric samples.

Name_____

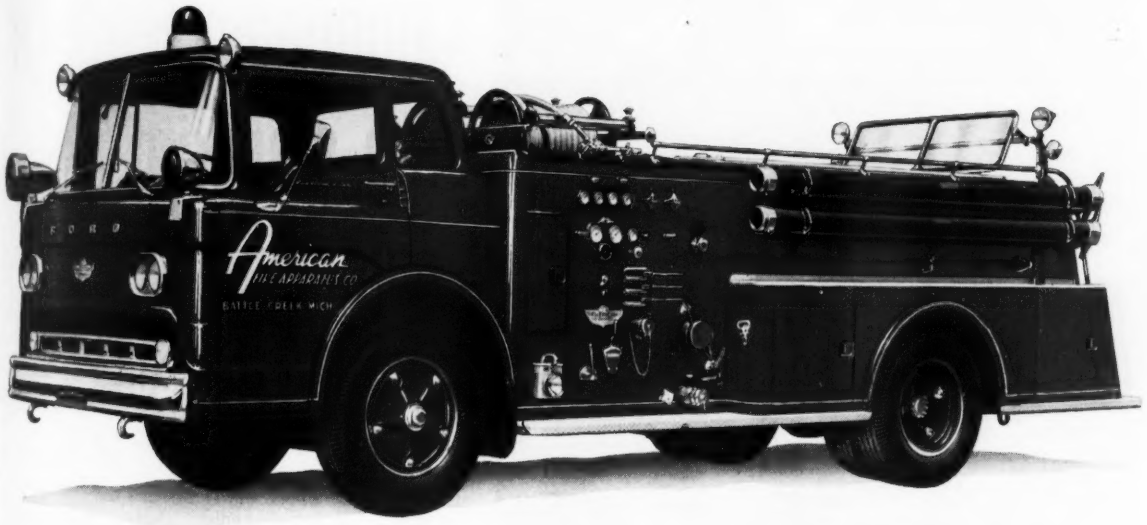
Address_____

City_____ State_____

NONE GENUINE WITHOUT THIS TRADE

MIDWESTERN SAFETY MFG. CO., Mackinaw, Ill.
Located in the heart of the Greater Peoria Manufacturing Area
Manufacturers of the Famous MACKINAW Safety Coat

Take a second look...



Barton-American 4-stage, 750 GPM Pump entirely driven by main truck drive shaft.

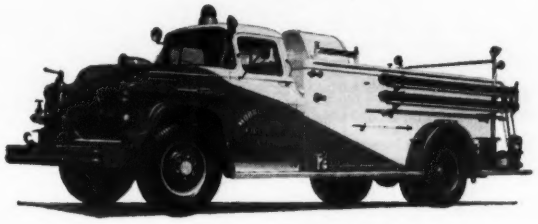
. . . see why owners *stay* satisfied with American Fire Apparatus

At the start, you get much more of what *you* want when you select American Fire Apparatus. That's because you can specify *more features* that suit your particular needs. Then, because we prize satisfied owners, we protect you with superior quality construction all the way!

For example, *our Barton-American Four-Stage Pump is the* only *make driven* entirely *through the truck's main drive shaft*—never *through the lighter-duty transmission p.t.o. This eliminates danger of an overloaded p.t.o. And it assures you of lasting ruggedness that is trouble-free.*

Take a second look *personally*. You'll see *many* better-engineered features —reasons why owners *stay satisfied* with American Fire Trucks. Ask our representative for proof!

Contact your nearest American representative for full details.



Equipped with famous Barton-American Front-Mounted Fire Pump.

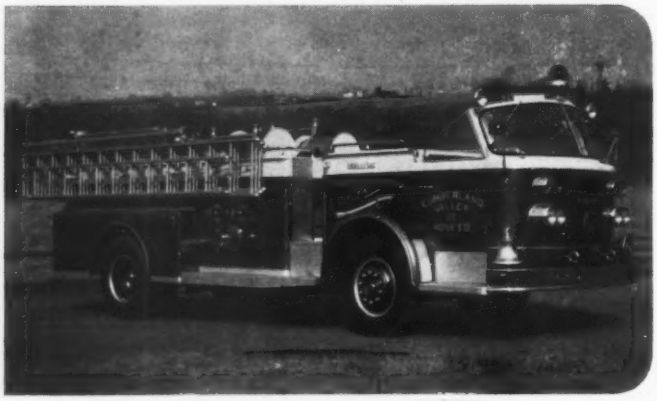
AMERICAN FIRE APPARATUS CO.

American

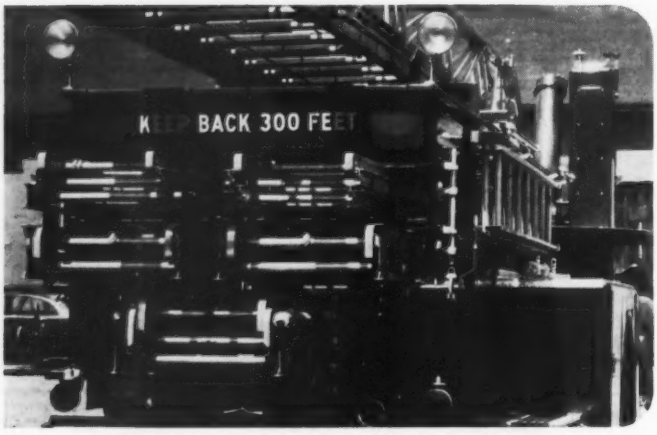
FIRE APPARATUS CO.

Main Office: Main Street Rd., Battle Creek, Mich. Plants at: BATTLE CREEK, MICH., MARSHALLTOWN, IA., STRATFORD, ONT.

An Alco-Lite 14′ Pumper Roof Ladder and 24′ Pumper Extension Ladder on a 900 Series American LaFrance Pumper.



An Alco-Lite 14′ Pumper Roof Ladder and 35′ Pumper Extension Ladder on a 900 Series American LaFrance Pumper.



This typical nesting of Alco-Lite Ladders on American LaFrance Aerials includes a 24′ Pumper Extension Ladder, 20′ Straight Ladder; 35′ Heavy Duty Extension Ladder, 28′ Pumper Extension Ladder; 16′ Pumper Roof Ladder, 35′ Heavy Duty Extension Ladder, and 50′ Heavy Duty 3 Section Extension Ladder.

Original Manufacturer of Aluminum Ladders

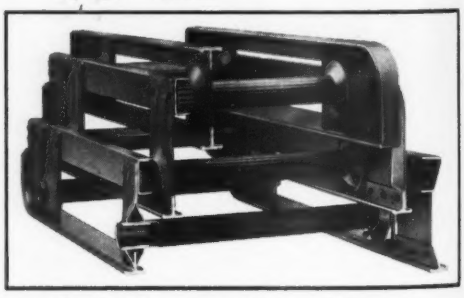
ALCO-LITE

aluminum ladders are standard equipment on these trucks

Alco-Lite Aluminum Ground Ladders are lighter weight . . . easier-to-handle . . . safe. Exclusive gusset plate, expansion bushing construction makes possible the open side rail,T-channel design. Excess weight adding bulk in the side rails is eliminated. More than meet all current tests for strength and safety.

Alco-Lite Aluminum Ladders are unaffected by moisture, water, fumes, gases. Won't warp, rust, rot, splinter, or burn. Almost maintenance free!

Rungs won't twist, turn, or break off. Feature non-slip type corrugations.

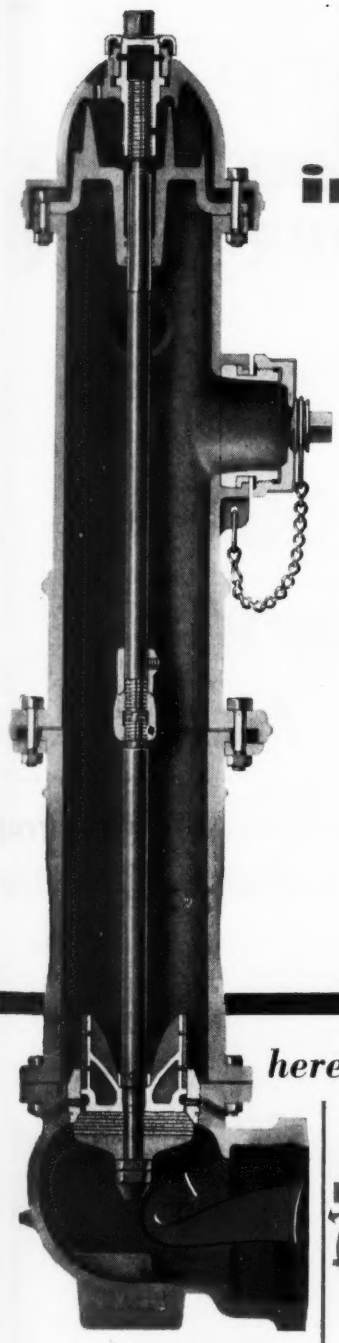


Channel slides prevent sections from disengaging. On large ladders, automatic spring loaded locks allow sections to extend, lock, and unlock simultaneously.

Aluminum Ladder Company

ALCO-LITE

FLORENCE S. CAROLINA



the MUELLER® improved hydrant is always ready for instant action!

Designed for above ground maintenance, Mueller AWWA Improved Hydrants have the bonus features that *count.*

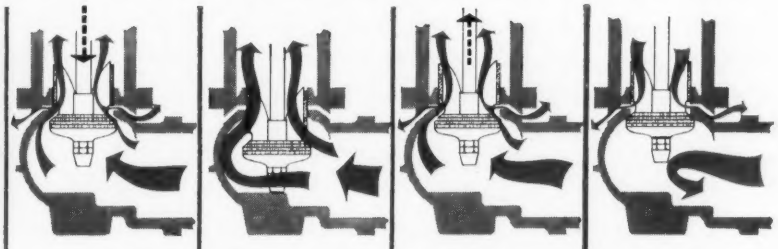
The compression-type main valve and two drain valves positively shut off the flow and drain the barrel after each operation.

Safety Flange design prevents barrel breakage resulting from traffic accidents and permits addition of barrel extensions to raise hydrant in keeping with grade changes.

360° rotation of the upper barrel permits proper facing of the breech-locked nozzles. Dry-top design seals all stem threads and bearing surfaces from water in the barrel during operation. A refillable oil reservoir maintains proper lubrication of the stem threads and bearing surfaces.

Add up these "bonus features" in Mueller AWWA Improved Fire Hydrants and you'll see why so many cities and towns have "Standardized on Mueller".

here's how the MUELLER *main valve works:*



1 Main valve fully closed. Barrel dry.

2 Hydrant opening. During first few turns of operating nut, full water pressure flushes drain ports.

3 Hydrant fully opened. Drain ports closed by sealing surfaces on main valve guides.

4 Hydrant closing. Drain ports again force-flushed by full water pressure during last few turns of operating nut.

5 Hydrant fully closed. Water draining from barrel through open ports.

For complete information and specifications, write direct to:

MUELLER CO. since 1857 SERVING the Water and Gas Industries QUALITY

MUELLER CO.
DECATUR, ILL.

Factories at: Decatur, Chattanooga, Los Angeles;
In Canada: Mueller, Limited, Sarnia, Ontario.

SIZE
8½" x 3"
WEIGHS
2¼ lbs.

THE LIFE YOU SAVE MAY BE YOUR OWN

Falcon
HOLBROOK RESCUE ALARM

Clip to your belt or smoke mask strap.
It could be the means of saving your life!

Designed by Chief Donald Holbrook in co-operation with Falcon Alarm Co., this simple but tremendously effective alarm is designed to be worn into fires by firemen and reserve squads. It triggers a penetrating blast that can be steady or coded—warning others that you need help! Loud piercing tone can be heard over sound of fire. Weighs only a few pounds — manually operated. Sight glass permits instant check of power supply.

Equally effective for workers in any field where trouble can occur and help can be signalled. You owe it to your men, Chief, to see that your men have this protection. Put a few units on each truck, now.

PRICED AT
$24.50
Per Unit
Bottle with 3 refill capacity
Freon 22
$5.60 each

CHIEF DONALD HOLBROOK
Meadowwood Fire Department
Fitzwilliam, New Hampshire
assures you that when purchased through the Rescue Alarm Co., net proceeds go to an endowment fund for the Meadowwood, New Hampshire Fire Dept.

RESCUE ALARM CO.

84 State St., Boston 9, Mass.

Please ship me Holbrook Rescue Alarms as follows:

_____ Alarms @ $24.50 ea.

_____ 2 lb. disposable puncture cylinder of **Freon 22** for recharging for **fire service** (sufficient for approximately 3 refills). Price: $5.60 ea.

_____ 15 oz. puncture cans of Freon 12 for practice use @ $1.95 ea.

_____ Refilling attachment, consisting of valve with built-in puncturing device and nipple to connect to the valve of Holbrook Rescue Alarm. May be used with horn from Holbrook Rescue Alarm and 15 oz. can of **Freon 12 as a practice unit.** Price: $6.15 ea.

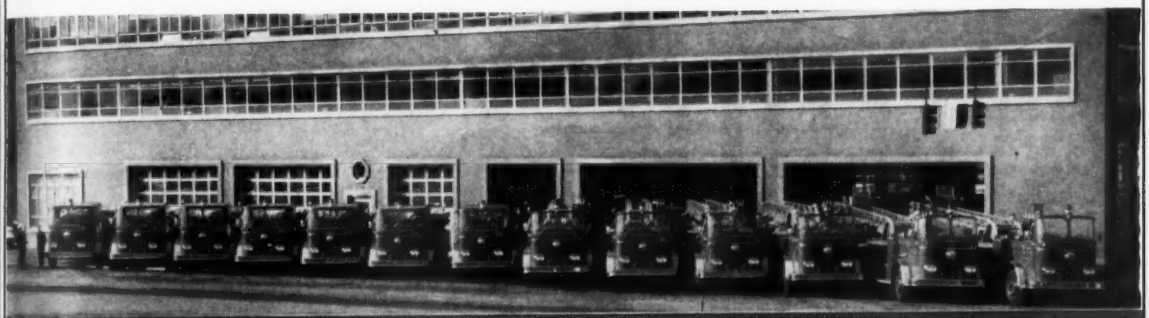
NAME _____

ADDRESS _____

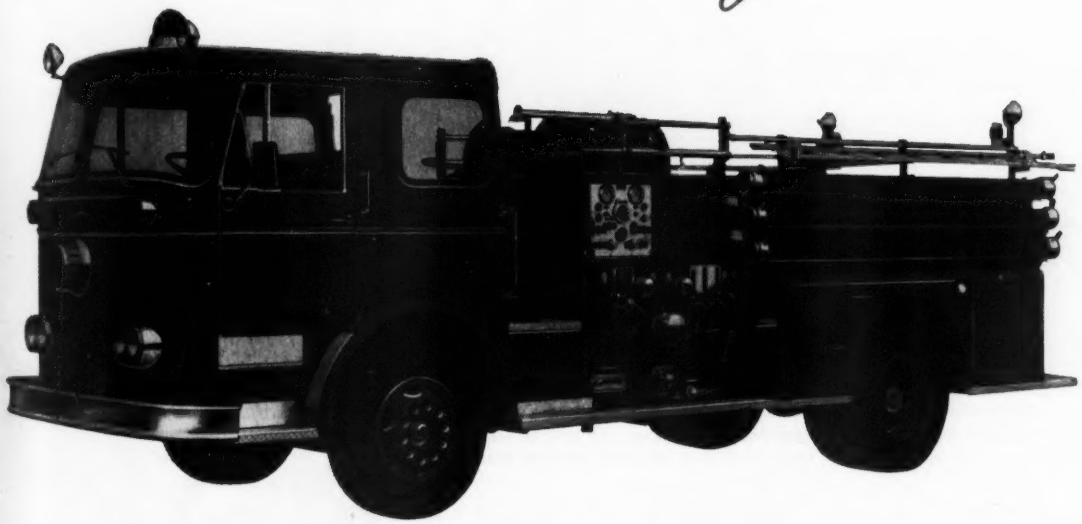
CITY _____ ZONE _____ STATE _____

Portland's

modernization program demands the most modern fire apparatus !



and modern means Seagrave



MAIL THIS COUPON

THE SEAGRAVE CORPORATION, COLUMBUS 7, OHIO. Please send complete information on:

☐ CAB-FORWARD ☐ CONVENTIONAL ☐ AERIALS ☐ PUMPERS ☐ OTHER_____

Name..... Title.....

Address..... F. E. 5-60

KING-SEAGRAVE LTD., WOODSTOCK, ONT.

ANOTHER SCOTT FIRST

AUDIO AND VIDEO SAFETY SYSTEM

Scott announces the Pak-Alarm, another "FIRST" in the safety equipment industry. This audible alarm, combined with Scott Air-Pak's present visual pressure gauge, produces an AUDIO-VIDEO Alarm System that insures unprecedented safety in Scott protective breathing equipment!

The Pak-Alarm is "cocked" when the cylinder valve is opened. Its loud, clear, minutes-long warning signal will "knock your ears off" and provides ample time for safe exit from hazardous atmospheres.

Pak-Alarm is connected directly to, and is actuated by, the air supply itself. It is extremely accurate and consumes virtually no air during its ringing period.

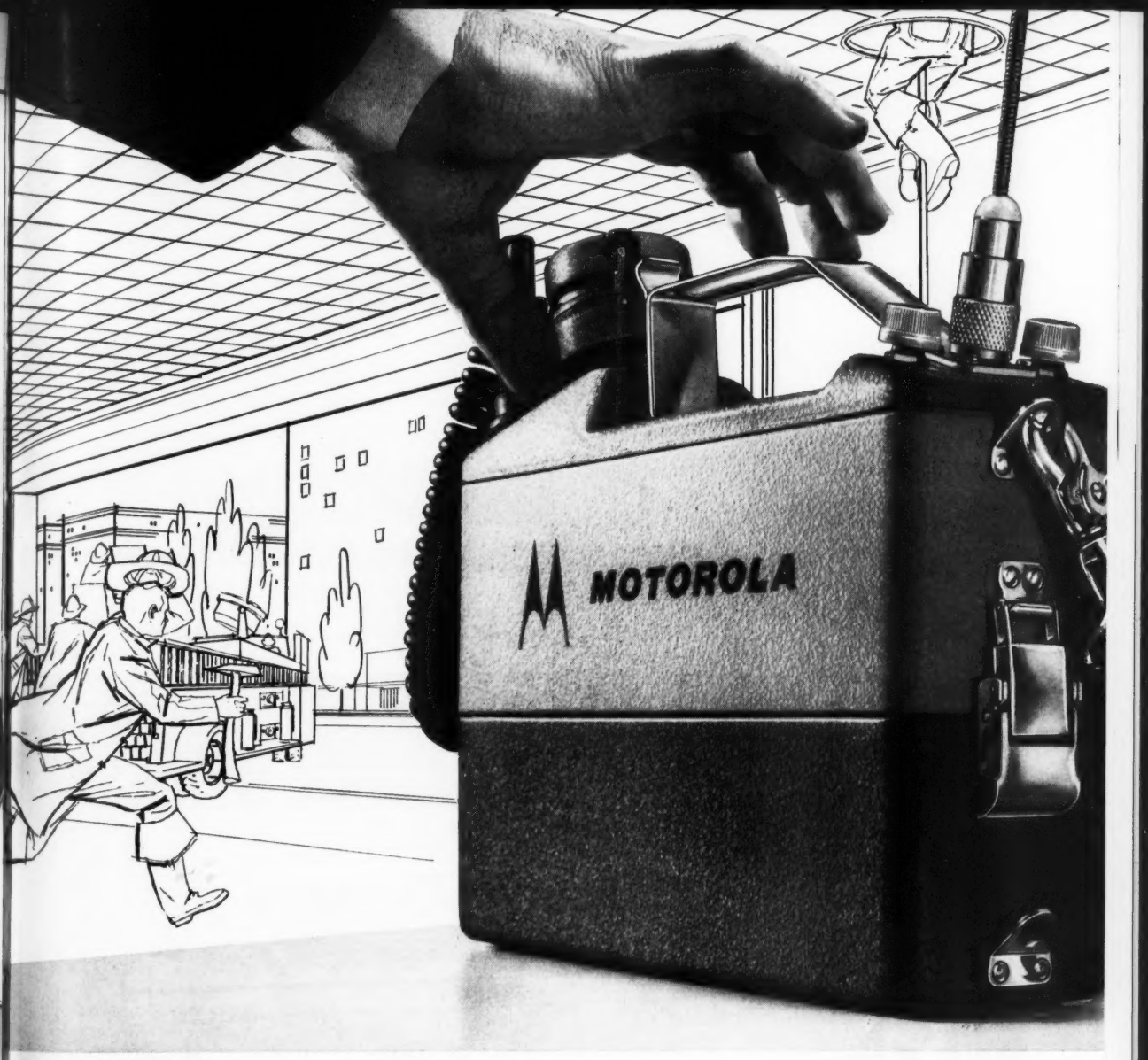
This "Dual Warning System" is good news for all Scott Air-Pak users. The optional Pak-Alarm can be easily attached to your present Air-Paks.

Ask your Scott distributor for a demonstration.

SCOTT AVIATION CORPORATION

215 ERIE STREET • LANCASTER, N. Y.

Export: Southern Oxygen Co., 250 West 57th Street, New York 19, N. Y.
Canada: Safety Supply Co., Toronto — Branches in Principal Cities



Be sure to take it with you...
YOU'LL NEED IT!

The instant you arrive, you're fighting for *control* . . . and those *first few minutes are critical!* Your Motorola "Handie-Talkie" portable radios will help you get reports from every trouble spot . . . and relay instructions in *seconds.* You are in constant contact with all members of your fire fighting team.

For faster fire fighting, make sure that you have *enough* "Handie-Talkie" portables.

Transistors, plated chassis and other improvements increase reliability . . . make this the smallest, lightest portable 2-way radio available. You also benefit from the long battery life and obsolescence-free design. And only Motorola can offer you a portable radio with a full 8 watts output. One of the 43 "Handie-Talkie" radios is ideal for your needs. Write for complete literature today.

MOTOROLA Handie-Talkie®
RADIOPHONE

Motorola Communications & Electronics, Inc., 4501 Augusta Blvd., Chicago 51, Illinois, A Subsidiary of Motorola, Inc.

Superior in Looks... Performance... Dependability

Above: Superior Royale Rescuer, 48" Headroom, Cadillac chassis.

Below: Superior "Suburban" Ambulance, 46" Headroom, on Pontiac chassis.

SUPERIOR Ambulances and Rescue Cars

Superior engineers and designers understand and appreciate the exacting demands made upon a professional emergency vehicle. Combine a generation of fine coach making and manufacturing know-how and you have the finest, most popular coach made. And Superior offers the only complete emergency fleet—five headroom heights on two famous chassis, each specifically designed for rugged use and dependable day-to-day performance. Convince yourself. Ask your Superior Distributor to arrange a test drive.

SUPERIOR COACH CORPORATION • LIMA, OHIO

SUPERIOR'S COMPLETE EMERGENCY FLEET. *On Cadillac chassis:* 42" Headroom Ambulance; 48" Headroom Rescuer; 54" Headroom Super-Rescuer. *On Pontiac chassis:* 40½" Headroom Ambulance; 46" Headroom "Suburban" Ambulance.

POWHATAN

DURA-FOG NOZZLE

THE "Finest" IN THE SERVICE

Knock down fires faster — easier!

Finer dispersion, uses less water ● Each nozzle sold has a 100% performance test ● A strong husky nozzle ● Maintenance free ● Greater reach ● Denser curtain ● No kick back ● Operates easily under high pressure ● TRY IT OUT! You can—by simply writing us and telling us you want to see and test it ● Write today!

OVER A MILLION SHUT-OFFS AND NEVER A LEAK!

Dura-Fog Nozzles have been thoroughly bench tested, to assure dependability ● Our goal was 250,000 shut-offs, actually tests have gone over a million with no leak!

FLOW IN GPM AT 100 PSI NOZZLE PRESSURE

SIZE	STRAIGHT STREAM	30° FOG PATTERN	60° FOG PATTERN	90° FOG PATTERN
1"	20	22	32	35
1-1/2"-60	57	60	72	88
1-1/2"-100	95	100	105	107
2-1/2"	135	165	190	225

SWIVEL OR SOLID BASE

SIZE	• List Price • Polished Brass	Chrome Plated
¾"-1"	$67.65	$72.05
1½"	72.05	76.45
(For Play Pipe)		
2½"	78.65	84.15
(Direct Conn.) 2½" Thd.		
2½"	91.85	97.35

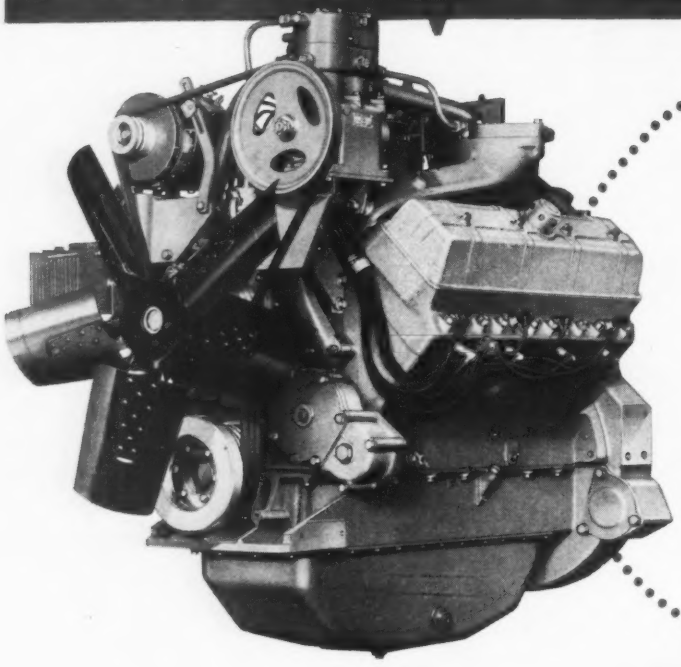
POWHATAN

BRASS & IRON WORKS

RANSON, WEST VIRGINIA

In The Same Location Since 1892

ROILINE V8 for FIRE FIGHTING

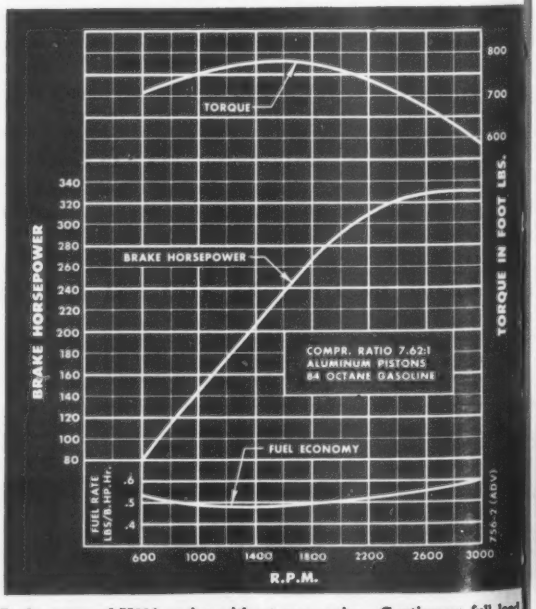


Model H884

ADVANCED V-8 DESIGN
330 MAXIMUM HP.
884 CU. IN. DISPL.
DUAL IGNITION AVAILABLE
QUICK ACCELERATION
GOOD FUEL ECONOMY
LOW MAINTENANCE COST

The ROILINE H884 is a compact, high compression, overhead valve engine with the added advantages of extra speed and power. This flexible V-8 power package is designed for the instantaneous response and quick acceleration necessary to fire fighting equipment. The short stroke design of this engine means slower piston speeds, with a consequent reduction in engine friction, even at high engine speeds. The box-like construction of the crankcase adds extra rigidity and bearing support to the crankshaft. The sturdy forged-steel crankshaft is short, due to V-8 compactness, with large diameter, wide surface bearing areas. The result is smooth operation with the least amount of vibration. Water cooled exhaust manifolds are standard on all H884 models. The combination of V-8 design, sturdy, compact construction, and quick acceleration makes the ROILINE H884 engine a top performer for fire equipment power.

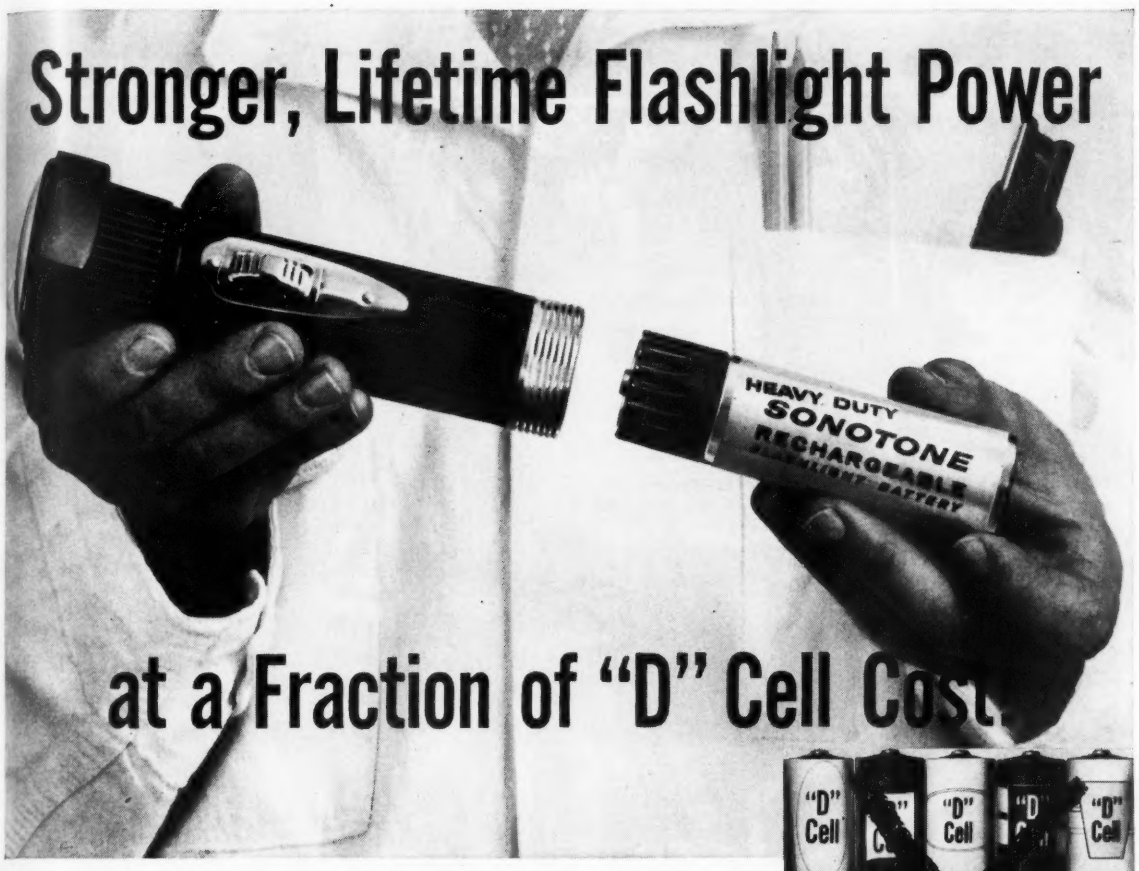
468



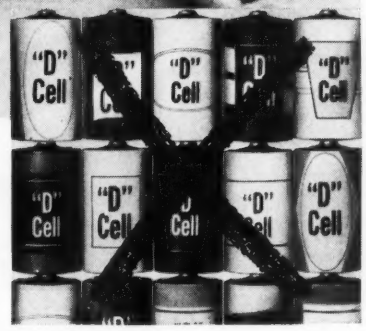
Performance of H884 engine without accessories. Continuous full load should not exceed 80%; intermittent, 90% of hp shown. Ratings conform to I.C.E.I. standards. Governors set for 2850 rpm idle and 2600 rpm full load. Consult Waukesha Motor Company for speeds for your service.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
New York • Tulsa • Los Angeles / **Factories: Waukesha, Wisconsin and Clinton, Iowa**

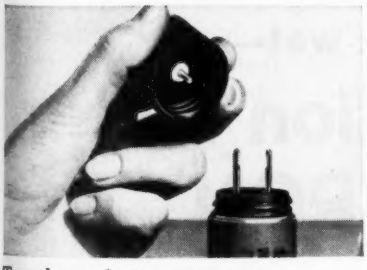
Stronger, Lifetime Flashlight Power



at a Fraction of "D" Cell Cost



Heavy-Duty Sonotone Rechargeable Flashlight Battery Cartridge



To recharge, just unscrew cap...

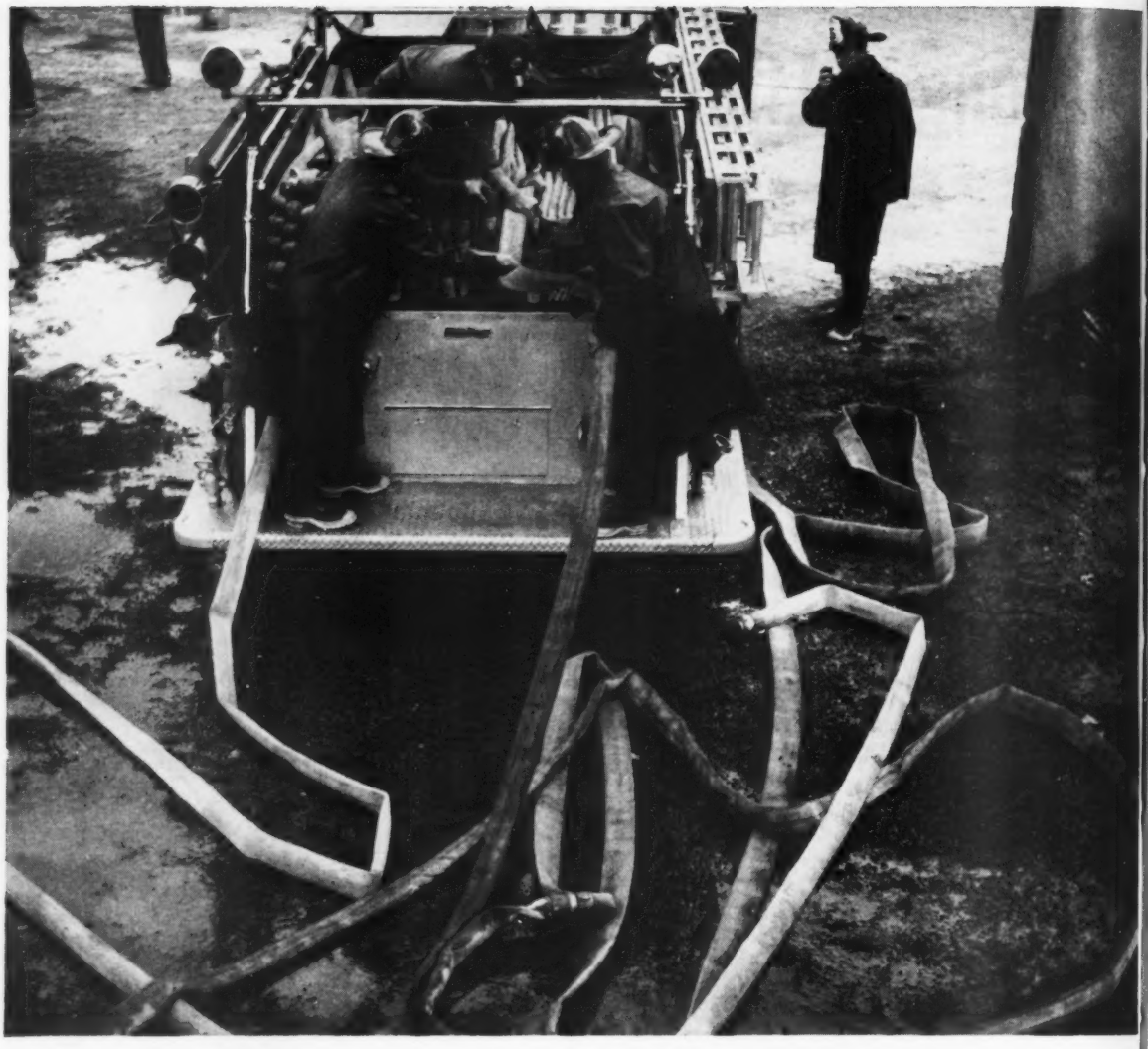
and plug overnight into any 110-120-volt AC outlet.

- **A multi-use adaptation of the patented Sonotone sintered-plate, nickel-cadmium battery used in space missiles and jets.**
- **Gives at least 3 hours of strong, continuous light from a single charge with PR-6 bulb—or 1½ hours with full-powered PR-2 bulb.**
- **Dependable in extreme temperature and weather conditions.**
- **Can be recharged hundreds of times at about ¼¢ per charge.**
- **Sturdy, leakproof construction—aluminum jacket—electrically shockproof.**
- **Full-year guarantee under heavy industrial use—backed by Sonotone's leadership of over 30 years in precision engineering and service.**

A completely new concept in flashlight battery efficiency and economy for industrial users! Replaces and outmodes any two "D" cells, for any purpose, in end-to-end use. Rechargeable overnight by plugging into any 110-120-volt AC outlet. Gives maintenance and service personnel a battery with a lifetime of use at a fraction of the cost of constantly replaced "D" cells. Dozens of applications—with railroads, aviation lines, municipal departments, public utilities and private industries. **Heavy-Duty Model FC-3** ($9.95 retail)—subject to your usual discounts. Also **Standard Model FC-2** for home use (light lasts at least 1½ hours with PR-6 bulb)—$7.95 retail. Write now for full details to:

Sonotone® CORP.
Battery Division, Dept. B57-50
ELMSFORD, N.Y.

Leading makers of fine transistor hearing aids, ceramic phonograph cartridges, speakers, microphones, electronic tubes, sintered-plate, nickel-cadmium batteries.



Fire hose you can repack wet—

Gets you back in action faster because of DACRON®

POLYESTER FIBER

The next fire won't wait—not for you to get ready, not for your hose to dry. Now you can get back into action faster, repack hose immediately, repack it *wet*—when its jacket is 100% Du Pont "Dacron"* polyester fiber.

The reason is simple. New hose jacketed 100% with "Dacron" won't be damaged or weakened by rot or mildew—no matter how many times you repack it without drying. It's ready to use again at once after each run.

Hose of "Dacron" is also more economical. It's highly resistant to abrasion, to damage from chemicals and oils . . . can give you many more years of dependable service. It handles easier, too . . . can save you precious seconds, critical minutes of fire-fighting time. Years of testing show the ability of "Dacron" fiber to meet these fire-hose requirements.

For greater dependability, for important savings in time and labor—be sure your hose is jacketed 100% with Du Pont "Dacron". See your supplier . . . or write for sources and free booklet on "The Hose That Needs No Drying". E. I. du Pont de Nemours & Co. (Inc.), Textile Fibers Department, Room 31E, Centre Road Building, Wilmington 98, Delaware.

**"Dacron" is Du Pont's registered trademark for its polyester fiber.*

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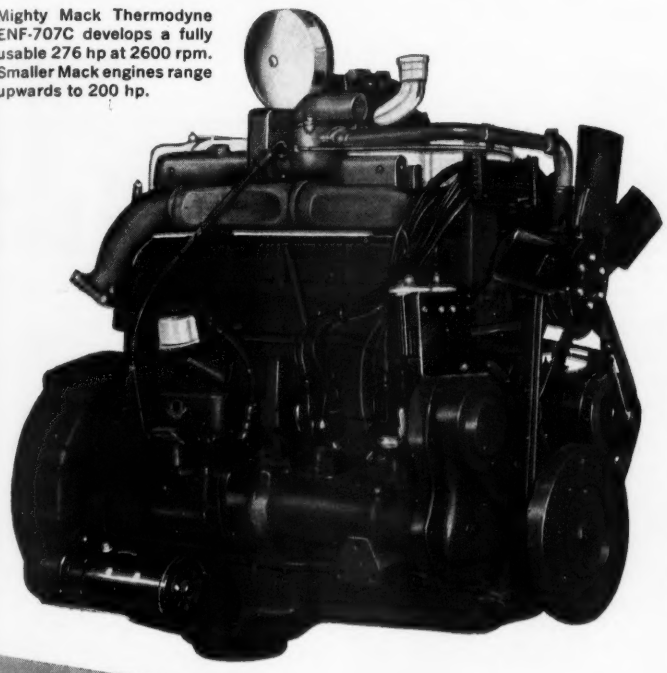

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Modern, overhead-valve design for greatest efficiency · combustion chamber and manifold design that gives optimum fuel mixture for most complete combustion and fastest starts · heavy-duty, *seven*-bearing crankshaft with 4" diameter main bearings —largest in the industry—electrically hardened for surface hardness with interior toughness · valve lifters faced with tungsten carbide to render them immune to wear and assure long cam and lifter life · full-length water jackets, plus directed water flow, to promote uniform cylinder temperature and more efficient lubrication · angle-split connecting rod bearing caps to permit largest bearings and easier maintenance.

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MACK ENGINES—Packed with power and performance

Heart of Mack fire apparatus performance is the famous Mack Thermodyne® engine—crafted to the industry's highest standards . . . tested through every stage of manufacture . . . designed for every fire-fighting need. Such is the efficiency of Mack engines that they outclass engines even of greater comparable rating . . . in both road and pumping performance.

Mack engines are made to work in harmony with all other Mack quality components—clutches, transmissions, front and rear axles, and cabs. Remember, Mack controls the performance of its finished product by making more of its own components than any other manufacturer and to higher standards. *You can depend on a Mack.* Mack Fire Apparatus, Allentown, Pennsylvania. In Canada: Mack Trucks of Canada, Ltd.

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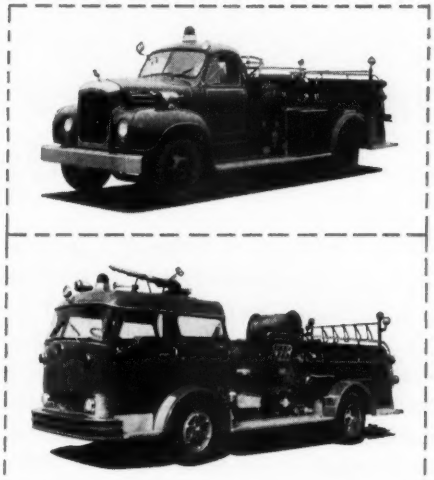

Apparatus as you want it. From the wide selection of Mack models you can have cab-forward or standard units . . . with conventional or automatic transmissions . . . with standard, two-stage pump or the new Uni-Control Hi-Stage pump . . . with air or hydraulic braking systems . . . with the gear ratios and built-in extras that you need.

COMPLETE LINE OF PUMPERS—500 to 1250 GPM . . . SQUAD AND HOSE WAGONS . . . AERIALS 65′ to 100′ . . . COMBINATION LADDER TRUCKS

Fire Chief G. L. Sartain and Fire Alarm Superintendent B. M. Pointer of Tulsa, Oklahoma (left to right), check operations in fire alarm headquarters. City's modernized Gamewell System unerringly guides 21 engine companies, 5 ladder companies, and 4 chief cars.

How Tulsa's Fire Fighters get the edge on fires

In Tulsa, Oklahoma, a modernized Gamewell Fire Alarm System gives fire fighters a real jump on fires. It alerts precisely the number of companies needed to fight a blaze . . . and permits them to respond to the alarm without even having to check its location!

When the alarm comes into the alarm center (above) the dispatcher merely checks a card file for company assignment. Then by radio he quickly and accurately dispatches the proper assignment of men and equipment. Code signal confirmation of the alarm is then transmitted to all stations. The efficiency of the new system will greatly benefit property owners in the city of Tulsa . . . faster response to each alarm will give the fire fighters an "edge" on the fire.

The new Gamewell System was precisely tailored to the specifications of Tulsa Fire Chief G. L. Sartain and Fire Alarm Superintendent B. M. Pointer. It includes 8 alarm circuits, 24 box circuits, a new PBX system, and voice dispatching equipment. There are now 264 street type boxes as well as 65 Master Boxes located in schools, public buildings, industrial plants, hospitals, and institutions.

Rapidly expanding Tulsa had simply outgrown its former 25-year-old Gamewell Fire Alarm System and wisely took steps to keep lives and property adequately protected. Are *your* city's fire alarm facilities keeping pace with growth? A Gamewell Survey will answer this question. No obligation. Write THE GAMEWELL COMPANY, 1251 Chestnut Street, Newton Upper Falls 64, Mass.

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FIRE ENGINEERING

VOL. 113, NO. 5 MAY, 1960

THE JOURNAL OF THE FIRE PROTECTION PROFESSION SINCE 1877

I. H. CASE

A Half-Century of Publishing Service

I. H. HERBERT CASE, familiarly known as "Bert" to a host of fire service and publishing friends and acquaintances retired May 1 as active publisher and general manager of FIRE ENGINEERING. He will continue in a consulting capacity for another year with the Magazine Publishing Division, Reuben H. Donnelley Corporation, publishers of FIRE ENGINEERING, and will then bring to a close 50 years in the publishing business.

Bert's career is a typical Horatio Alger saga of American business history. He started as an office boy on February 10, 1911 with FIRE ENGINEERING when it was known as "Fire and Water Engineering." Two years later he was promoted to assistant editor and began his climb through the ranks. To prepare himself for future goals, he completed high school by attending classes at night and then continued his education for several years by means of evening classes in journalism and administration at Columbia and New York Universities.

Eventually he became part owner with Fred Shepperd and Karl Mann of the Case-Shepperd-Mann Publishing Corporation and served that organization as vice president-general manager for many years. In 1955 the C-S-M group of magazines was merged with the Donnelley Corporation as a department and Bert became general manager.

His personal contacts with fire service officials began in 1913 when he attended the International Association of Fire Engineers conference in New York City. He hasn't missed the annual I.A.F.C. event since that time and he believes he holds the record over all living persons for continuous yearly attendance.

Since 1920 he has been privileged to sit in on every Board of Directors meeting held by the Association and has actively assisted this group and the organization at every opportunity. The Association first recognized his many contributions when they presented him an Honorary Life Membership in 1927. This was primarily for his work on behalf of "The Fire Brigade," a feature motion picture produced by Metro-Goldwyn-Mayer with I.A.F.C. participation and support.

He has served on numerous committees of the Association, more recently as co-chairman of the Annual Conference Program Committee. For many years he was the I.A.F.C. director of public relations.

Bert has contributed several conference papers, most notable of these being "Preparing for War Emergencies." The latter was in collaboration with Fire Chief and Commissioner John J. McElligott, New York City Fire Department, and was presented at the 1937 conference held in Oklahoma City. It was widely quoted and commented on by the press throughout the country and later published in the November 1937 issue of FIRE ENGINEERING. Numerous reprints of it were distributed by the International Chiefs. With the growing international tension at the time which eventually led to World War II, the paper was remarkable as it accurately forecast the part the fire service would have to play under wartime stress.

The fire service will continue to have the use of Bert's service and unusual talents. Upon his retirement from active publishing, he was immediately appointed chairman of a newly created I.A.F.C. board which will function in an over-all policy advisory and planning capacity.

Bert will continue to reside at his home at 176 Saxon Woods Road, Scarsdale, N. Y., and beyond acting as a consultant for Donnelley and working with the International Association of Fire Chiefs, he has not yet made any other plans. He does intend to take a well-earned vacation and devote some time to travel now that his schedule will permit him to do so.

The entire staff of FIRE ENGINEERING extends to him its best wishes on his retirement and gratefully acknowledges his wise counsel, unerring judgment and solid support in the past.

Hlow O'Brien

Brigade goes into action at surprise drill. When the alarm sounded, all the fire fighters were at their regular jobs. Until they arrived at the location, and were given problem to solve by Chief Guattery, they were unaware it was not an actual fire

—Photos courtesy Union Carbide Plastics Company

Fire fighter wets down "burning" propane gas tank. Within four minutes after alarm sounded, men had water on the "fire"

Above: With "fire" out, brigade member, still clad in protective suit, checks tank valve

Left: Members of rescue squad-ambulance, who respond to all alarms, care for a "casualty." The plant's brigade has a mutual aid pact with the nearby American Cyanamid industrial fire brigade

How Union Carbide Plastics Company protects its plant from fire

By **FRANK HANIFIN**

POTENTIAL FIRE HAZARDS are inherent in the manufacture of synthetic resins and molding compounds —the basic materials of the plastic industry. Protecting a plant from fire is important, not only to the company and its employees, but the economy of the community could also be seriously impaired by any interruption of production.

To find out firsthand how the management protects such a plant from fire, the writer visited Union Carbide Plastic Company's plant at Bound Brook, N. J., interviewed the plant's fire chief, Mark Guattery, and the plant's fire protection engineer, William B. Lynch, and watched the plant fire brigade solve a problem during a surprise drill.

Mr. Lynch has been fire protection engineer at the plant for the past 20 years. Chief Guattery was formerly assistant chief of the Middletown, N. Y., Fire Department. He began his fire service career as a volunteer in Middletown and has served as a section leader in the Stewart Air Force Base Fire Department; as a section leader, U. S. Army Fire Service during World War II; and as a member of the U. S. Military Academy Fire Department, West Point. He also served as Orange County, N. Y., fire instructor from 1950 until his appointment at the plant in 1958.

The hazards

The National Board of Fire Underwriters in Research Report No. 1, "Fire Hazards of the Plastics Industry," points out that most of the gases and liquids used in the manufacture of synthetic resins and molding compounds are highly flammable. When mixed with air, many are explosive. The grinding, milling and blending of synthetic resins with wood flour and other finely divided materials present the hazard of dust explosions. The use of high temperatures and high pressures also creates hazards.

Union Carbide Plastics Company is primarily a manufacturer and supplier to industry of plastics and resins that are further fabricated or processed into end products by its customers. At its Bound Brook plant, the company manufactures phenolic, polyethylene, polystyrene, epoxy, and vinyl resins, compounds and film and sheeting.

Among the flammable liquids stored at the plant are: Benzene, methyl ethyl ketone, toluene, acrylonitrile, toluol, ethylbenzene, styrene monomer, formaldehyde and phenol.

Every new employee and even former employees returning to the company must see a series of sound slides which indoctrinate them with the plant's fire safety principles and practices. Thus they are introduced to the traditional "fire triangle," the types of extinguishers in the plant and the kind of fire each is designed to extinguish, the fire alarm system and the water supply system. In addition, the employee is warned about the company's stringent enforcement of smoking regulations.

On a broader policy level, whenever a new building is planned for the plant, the safety division is called in for consultation during the designing of the building to make recommendations for over-all fire safety.

Fire protection

All buildings in the plant are protected by sprinklers and standpipes. In all except the older buildings, these systems may be supplied independently of each other although, because of the excellent water supply and pressure, it is ordinarily not necessary to hook up to a building's standpipe or sprinkler connections with a pumper.

A foam hydrant system protects certain areas of the plant, and all critical areas are protected by automatic foam or water deluge systems which are operated by a heat-actuating device. The alcohol tank farm is diked and protected by an inert gas blanketing system.

Dust collectors throughout the plant are protected by automatic carbon dioxide systems, or can be flooded with an inert gas. As a final resort, water spray is used to control fires in these collectors. The big bins in which resins are stored are protected by automatic carbon dioxide systems similar to the type used in record vaults.

An explosion control system protects one of the unusual hazards of the manufacturing process. Certain molding materials are mixed in stages on three different floors. They pass through ducts from one stage to another. Each floor is isolated by explosion dampers in the duct, which are released by the percussion of dynamite caps. An increase in pressure or temperature activates the system, closing all dampers in the duct and shutting down all operations in the building.

Water supply

The Bound Brook plant has its own water system with a 30-inch intake from an unlimited source of supply—the Raritan River. A pump house at the river houses a twin six diesel fire pump capable of pumping 2,500 gpm at 120 psi. A 1,500-gpm steam pump in the power house provides additional pressure if needed. Water for the steam pump is stored in a million-gallon reservoir and in a 50,000 gallon elevated tank. Mains throughout the plant are 10-inch and 14-inch and are looped so any break can be isolated. Static pressure in the mains is maintained at 100 psi. There are 56 hydrants in the system, and every hydrant is gated. The plant uses New York Corporation thread and as the surrounding communities are equipped with National Standard fittings, the company brigade carries adaptors on its apparatus.

The fire brigade is staffed by 17 maintenance men on each shift. Under modern production methods, the general workman is usually familiar with only his own part of the operation and the locality where he performs. The maintenance men are selected because their work gives them a familiarity with all areas of the plant and they are stationed throughout the plant. At present 16 foremen are being trained to serve as emergency captains. Four shift foremen serve as deputy chiefs.

The plant also has its own coded

Continued on page 430

Station of Engine 14 is tastefully landscaped and a credit to neighborhood. Six buildings of this basic design have been completed

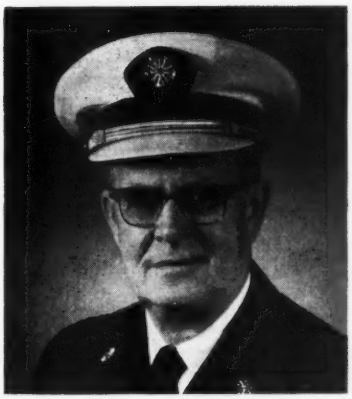
Portland Modernizes Its Fire Bureau

A $3-MILLION MODERNIZATION program for the Fire Bureau of Portland, Ore., is now under way. The initial planning for this program began four years ago and will not be fully accomplished for two to three more years. Over the past several decades Portland's growth pattern has been one of merging with outlying communities. Most of these were distinct municipalities, each with its complex of commercial and residential facilities and a fire department. The areas between these annexed municipalities gradually became subdivided and thickly settled, requiring fire protection. This was provided by filling in with neighborhood stations.

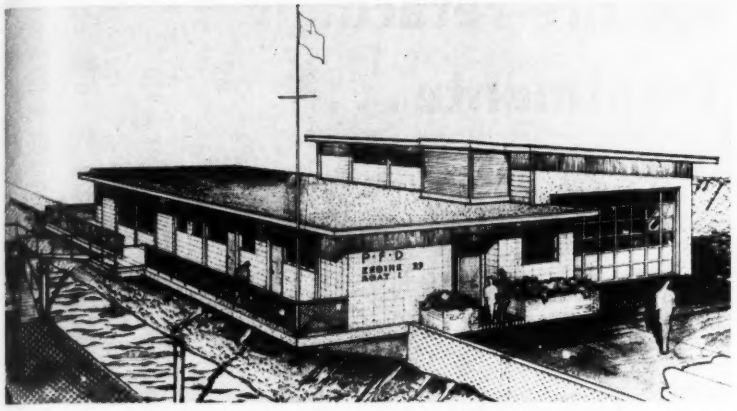
After World War II, population pressures developed new areas badly in need of fire protection. Portland was confronted with a pattern of fire station locations unnecessarily close in older areas, and too sparse in the new growth areas. Some stations then in use were erected 50 years or more ago in districts once suburban. Industrial, business, highway and neighborhood developments since that time had completely changed the determining factors involved in station location and the distribution of engine and truck companies had become badly out of balance.

In the past, funds had not been available to make regular replacements of obsolete fire apparatus. The bureau requested necessary replacements each year, but had invari-

New apparatus lined up in front of Central Fire Station includes seven 1,250-gpm pumpers and six aerials which were recently placed in service. Delivery was made overland with very satisfactory results—Seagrave Corp. photo



Portland's Chief Harold E. Simpson recognized fire protection problems and led successful campaign to convince city of fire department's needs
—photo by Gladys Gilbert Studio



Combination station of Engine 29–Boat 1 is now under construction with completion scheduled for mid-1960. Holman J. Barnes, A.I.A., is the architect

ably been turned down because of lack of money. This resulted in severe replacement cycles and expensive replacement intervals. In 1958, Portland found itself with approximately 30 per cent of its apparatus over 18 years of age. Seven of 24 pumpers were 15 to 20 years old; three of eight ladder trucks were 15 to 30 years old, five of eight hose trucks were 15 to 20 years old; three of eight miscellaneous pieces of fire apparatus were 18 to 27 years old, and all three fireboats were 31 years old and badly in need of overhauling.

The fire alarm circuits consisting of underground, lead-sheathed cables (many of them 40 years old) were deteriorating and frequent emergency repairs were required. Also, new circuits and extensions to new fire stations were needed.

The last major overhaul and expansion of the fire alarm system was in 1928, when the alarm headquarters were moved from the city hall to its present location. This resulted in a "patched-up" and expensive cable layout. The city has grown considerably during the past 32 years and the efforts of the alarm superintendent to keep pace with growth and provide adequate maintenance and improvements were stifled by limited funds.

Study and planning

It became apparent to Chief Harold E. Simpson that to continue to add new fire stations to protect new growth areas without reducing the overlapping coverage in the older areas of the city would present a considerable and possibly unnecessary tax burden on the entire community.

In July 1956, he initiated a careful study of the city's fire protection requirements and made recommendations for operating economies and modernization to Fire Commissioner Stanley Earl. Five teams of fire officers were assigned to make separate studies of fire station distribution in relation to present and anticipated protection needs. All were instructed to use the principles set forth in "Municipal Fire Administration" (International City Manager's publication) and the requirements of the National Board of Fire Underwriters as criteria for the study. Each group, working independently, produced strikingly similar solutions which were examined and evaluated, and a preliminary station relocation plan was developed. The necessary readjustment of fire station locations could not be made piecemeal without leaving many areas uncovered. It was therefore concluded to accomplish the program in one coordinated project.

Solutions and procedures

It was concluded to be most practical and economical to borrow capital to finance the modernization program. A $3,000,000 Fire Bureau Facilities and Equipment bond measure was prepared for submission to the voters and the proposed expenditures were to be allocated generally as follows:

1. $1,500,000 for the construction and relocation of 13 new fire stations and the remodeling of three others. Twenty-two old and poorly located stations were to be abandoned, leaving a total of 31, or six less than had been in use at one time.

2. $900,000 for new apparatus and equipment and extensive overhauling of the fireboats.

3. $600,000 for modernizing and extending the fire alarm system.

Representatives of the newspapers, churches, civic organizations and other responsible groups were invited to meet with fire bureau officials and become acquainted with the merit and urgency of this measure. Each recognized the urgent need for these funds to continue a safe level of public protection and rallied in support of the program. No organized opposition developed, and the measure was approved by the voters in May 1958.

Accomplishments

To date, six new fire stations, each designed to house two pumpers and an aerial, have been completed with the most recent in January 1960. All are nearly identical in design and are constructed of structural clay reinforced brick with 4,153 square feet of floor space. The buildings as constructed have no hose towers. The original plans included towers, but they were eliminated to reduce costs approximately $8,000 per station, and to present less objectionable building lines in residential neighborhoods. Fire hose is dried in electric hose dryers and stored in portable racks. The roof is a 20-year construction with 1½-inch insulation, and heating is by hot water. The main doors to the apparatus floor have automatic opening devices which

Continued on page 435

PAINT—an effective sealer for fire-retardant treatments . . .

The author inspects painted samples of southern pine boards pressure-impregnated with fire-retardant chemicals and exposed to weathering for 10 years

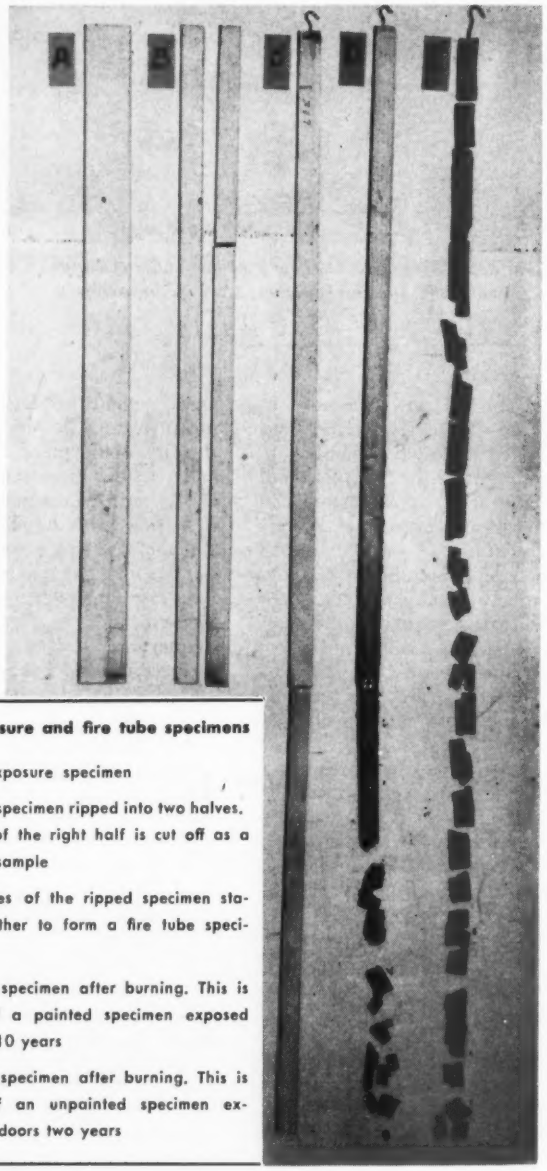


Fig. 1. Exposure and fire tube specimens

A. Typical exposure specimen

B. Exposure specimen ripped into two halves. The top of the right half is cut off as a moisture sample

C. Two halves of the ripped specimen stapled together to form a fire tube specimen

D. Fire tube specimen after burning. This is typical of a painted specimen exposed outdoors 10 years

E. Fire tube specimen after burning. This is typical of an unpainted specimen exposed outdoors two years

By D. L. DAVIES*

SALTS used for the fire-retardant treatment of wood are injected in water solutions. When the wood is dried after the treatment, a degree of fixation takes place which renders the salts less soluble. Tests have shown, however, that if the treated wood is subjected to outdoor exposures, the elements will soon solubilize and leach sufficient of the salt to remove most of the fire-retardant effect. For this reason, the use of fire-retardant treated wood has been restricted to interior or weather-protected construction. Its use has been questioned in areas of high humidity if frequent condensation of moisture might occur. Actually, it is necessary that liquid water from the interior move to the surface of the wood and drip from it in order to move the salts. Alternate moistening and drying has no effect in reducing concentration of fire-retardant salts.

Ten years ago, tests were initiated to determine whether an application of white house paint would protect the treatment from the weather. The results were outstanding. One application of a three-coat paint system gave excellent weather protection for the entire 10-year period of the test, even though the paint film became badly weathered during the years of exposure. Similarly, one application of a three-coat paint system gave essentially full protection to the treatment when the test material was immersed in running water for 4,000 hours.

* Manager Technical Department, Koppers Company, Inc.

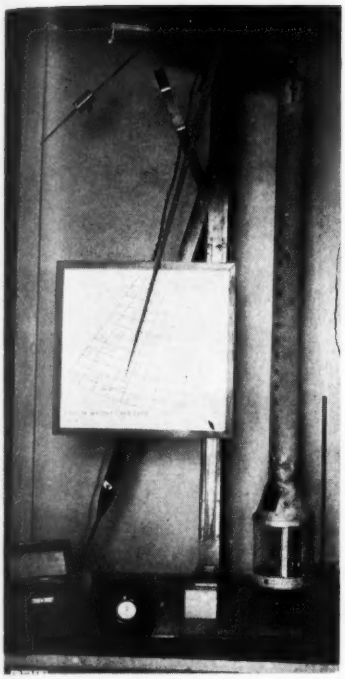


Fig. 2. Apparatus for fire tube test for combustibility —U. S. Forest Service, Forest Products Laboratory photo

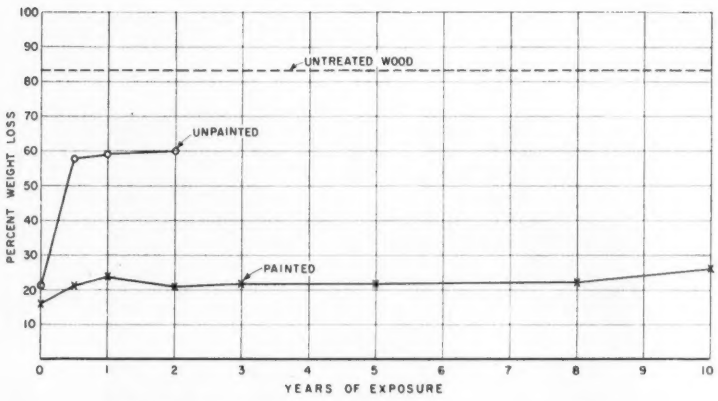


Plate 1. Fire tube test results for outdoor exposure tests

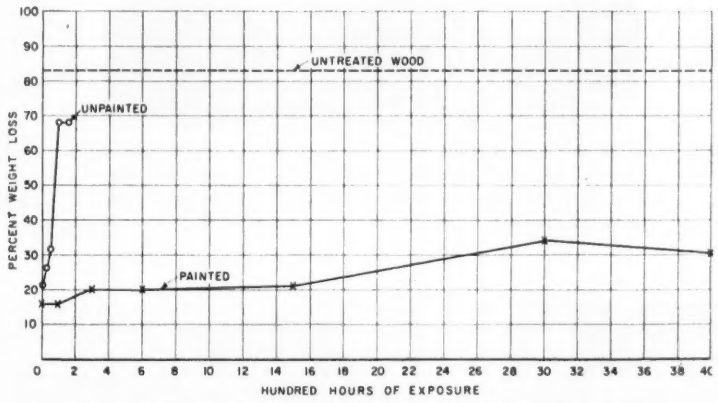


Plate 2. Fire tube test results for exposure tests in running water

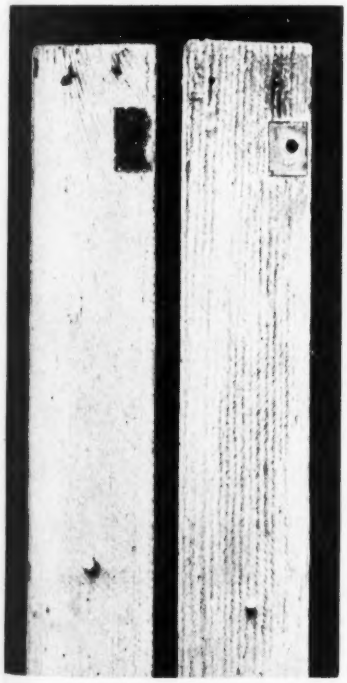


Fig. 3. Typical condition of paint film after 10 years exposure outdoors

For both exposures, wood test specimens were prepared in the same identical manner. A total of 420 specimens, 3/8 x 1 5/8 x 24 inches, were cut from kiln-dried, southern pine boards. All specimens were pressure-impregnated with a standard fire-retardant formulation meeting the minimum Underwriters' Laboratories requirement for certification. All specimens were then placed in a dry kiln and dried to a moisture content of 12±3 per cent. The dried specimens were then divided into two groups. One was designated as the treated unpainted controls. The other group was painted with a primer and two coats of white house paint.

A portion of each group was then selected at random for exposure in running water. The remainder were placed on outdoor exposure racks.

In the water test, specimens were completely submersed in running water. At intervals of 24, 48, 96 and 144 hours, unpainted specimens were removed. Painted specimens were removed after 96, 300, 600, 1500, 3,000 and 4,000 hours. As specimens were removed, they were conditioned in a dry kiln. Each specimen was then ripsawed to form two pieces, each 3/8 x 3/4 x 24 inches. These were stapled together endwise to form a single specimen 3/8 x 3/4 x 48 inches (Fig. 1) which is a Standard Forest Products Laboratory fire tube specimen. All specimens were tested in the fire tube apparatus (Fig. 2) in accordance with the procedure outlined in ASTM E-69, "Combustible Properties of Treated Wood By the Fire Tube Apparatus."

In the outdoor test conducted at Orrville, Ohio, specimens were placed on sloping racks, wide faces to the south, at an angle of 45 degrees with the horizontal. At intervals of one half, one and two years, unpainted specimens were removed. At intervals of one half, one, two, three, five, eight and ten years, painted specimens were removed. As specimens were removed, they were conditioned in a kiln, ripped to form fire tube specimens, and tested in the fire tube apparatus as previously described.

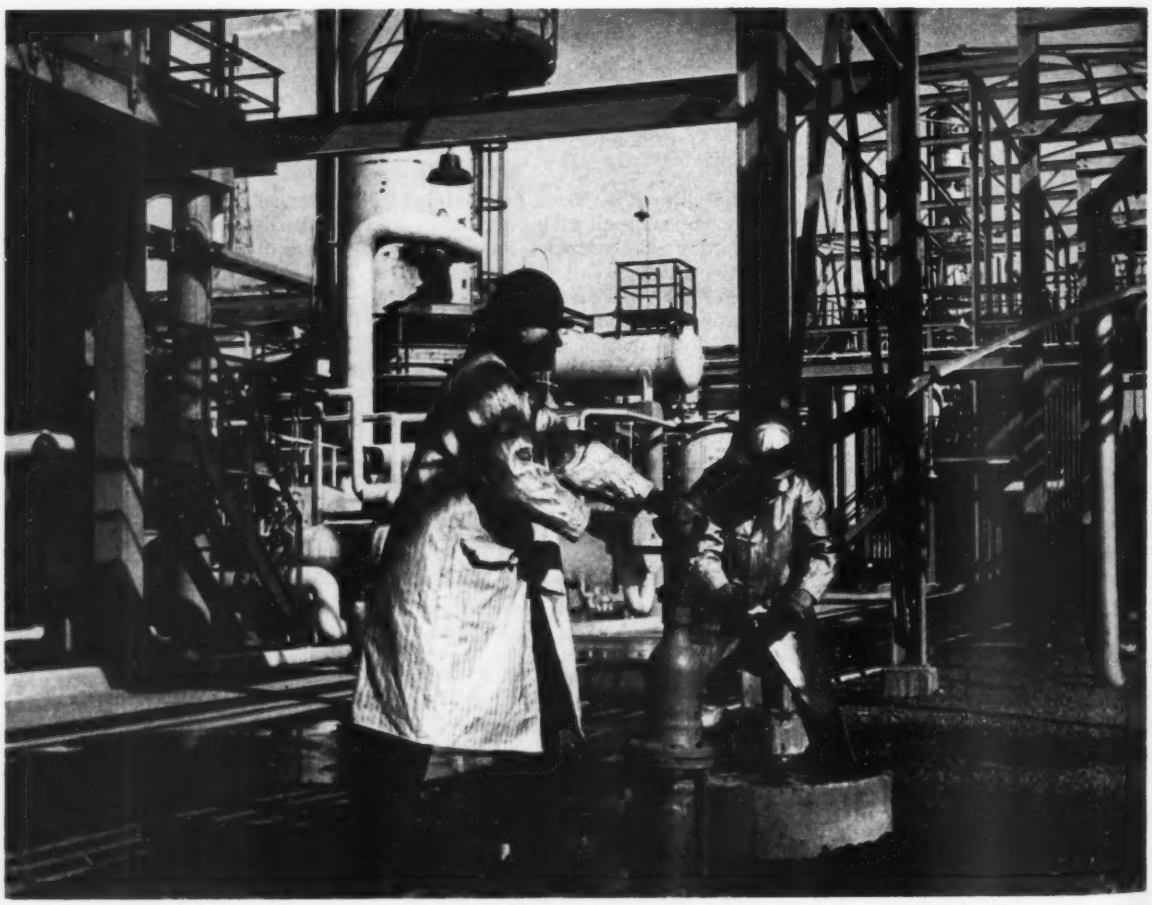
Initially, the unpainted control specimens had a weight loss of only 22 per cent in the fire tube test as compared to weight losses of 80 to 85 per cent expected in untreated samples. After 100 hours of leaching in running water, the weight loss in the fire tube test was 68 per cent and it leveled off at this point on further leaching. In comparison, the weight loss for the painted specimens was only 30 per cent after 4,000 hours of leaching in running water.

Continued on page 438

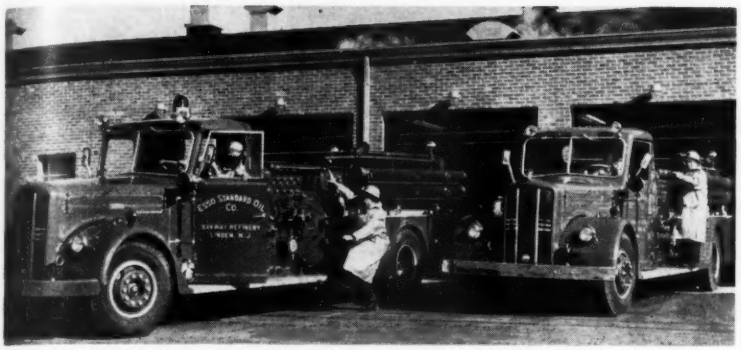
Workman dons aluminized suit prior to repair work on unit as required by safety department regulations. The suits and other protective gear are housed in boxes near every operating unit in the refinery

Protecting a Petroleum Refinery

Esso Bayway boosts safety and production through plant-wide fire fighting organization



Fire brigade members place a monitor nozzle in operation. These nozzles are used to cool the steel structures to prevent warping and other metal damage, and to confine the fire—*All photos courtesy Minnesota Mining & Manufacturing Co.*



Esso Bayway firemen roll out of the fire station in response to an alarm. At the same time, fire brigade members speed directly to the scene of the fire, while volunteers report to the fire station for equipment and directions

By HARRY T. BLACK*

THE HIGHLY VOLATILE NATURE of the products processed in any petroleum refinery makes topnotch fire protection absolutely essential to the safety of the workers and smooth operations. One of the larger facilities in the world, Esso's Bayway Refinery at Linden, N. J., consists of a tank farm, processing area, office buildings and docking facilities for the largest tankers, in an area of 1,545 acres. It has a daily capacity of approximately 165,000 barrels, or 6,900,000 gallons, of products ranging from gas to industrial fuel oil.

In the refining process, petroleum products are heated to temperatures up to 950° F. In all cases the materials are piped through stills at temperatures far above that required to make them burn if exposed to air. If a leak occurs in the system, some materials ignite immediately.

A refinery is a chain of units. Each of the units are interdependent and a fire in one upsets some of the others. The workers, in their daily jobs of regulation and maintenance, must remain alert and be prepared to meet any emergency immediately.

Organization and training

The fire organization at Esso's Bayway Refinery, supervised and trained by Chief John "Red" Hoff, is composed of a fire co-ordinator, nine full-time firemen, a fire brigade of 100 men, and 120 volunteers of the mechanical crafts, all of whom are trained in fire fighting.

In addition, the City of Linden has four fire companies and a total complement of 74 men which can respond, if necessary. Under an agreement of the Linden Industrial Mutual Aid Council (LIMAC), nine industries and the City of Linden have developed a highly organized plan whereby one member can obtain immediate help from the other members in fighting fires or dealing with any disaster. The police department acts as the central message center for LIMAC; a given signal brings the combined facilities into action. Linden is one of the originators of this kind of program, which is co-ordinated with civil defense and has served as a blueprint for other communities in the nation.

All employees except clerical workers receive basic fire fighting training at the refinery's special school. After classroom instructions, the "students" perform actual field exercises in fighting fires with extinguishers and hose lines. They learn how to use aluminized proximity suits and coats by wearing them during the exercises.

The members of the fire brigade and the volunteer group receive intensive advanced training in addition to the basic training program. In acquiring the skills of regular firemen, these men operate foam columns, generators, relay pumps and hose hookups, as well as learn the effective use of chemical and mechanical foam. The volunteers are organized into sections directed by leaders and assistants.

The men who comprise the fire brigade, about 25 per shift, are specially designated according to their full-time jobs. In the event of a fire, they immediately perform predesignated tasks without waiting for instructions. Speed is of paramount importance in putting out refinery pressure fires, which can be extinguished only by cutting off the fuel to isolate the burning from other units in the processing chain.

Contained fires, unlike pressure fires, are extinguished by cutting off the air supply. Because the fuel is limited and confined, there is less danger of such a fire spreading.

Fire fighting equipment

Each operating unit in the refinery is protected by several turret nozzles which can be trained on a given area and left unattended while continuing to play a steady stream of water on the target. Several reels of hose are enclosed in special boxes next to each operating unit. Combination nozzles are employed so that water fog also can be used to extinguish oil fires. Fog is the only form in which water ever is used directly on any oil fire. Two to four 150-pound wheeled dry chemical extinguishers are also located at each unit, as well as portable hand extinguishers housed on all elevation levels.

Respiration equipment, wool emergency blankets and at least one aluminized proximity suit are contained in glass-covered boxes at each operating unit.

Reserve air foam tanks of 1,000-gallon capacity are located at strategic points and can be brought up to service the two 1,000-gallon air foam pumper trucks by a truck similar to a straddle truck. Other vehicles include a hose and ladder truck, four straddle trucks, a utility truck for hydrant and fire line repair, a rescue truck equipped with first-aid essentials and aluminized rescue suits, and a chief's pickup truck with a 350-pound dry chemical extinguisher. All trucks carry radios and aluminized fire blankets.

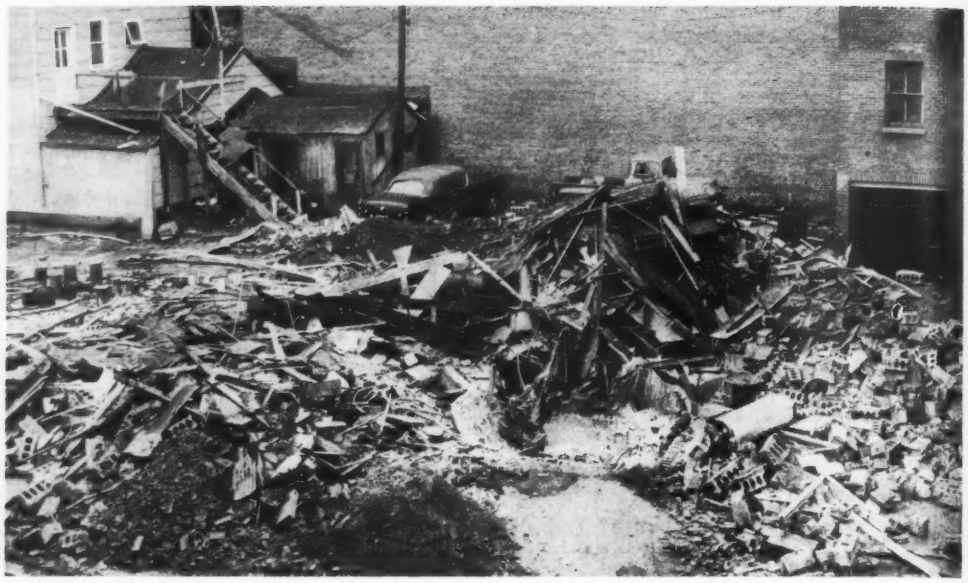
Spotted throughout the refinery are 30 hose houses, each with two hose carts carrying four 50-foot lengths of 2½-inch hose; two foam trailer houses; 20 straddle-truck trays, each with 200 50-pound cans of foam powder, two generators and two trays with 10 foam columns on each. The foam columns, which are erected by hand, enable fire fighters to pump foam over the top of a tank onto the surface of a burning liquid.

Procedures

When an alarm is sounded, fire brigade members report at once to prearranged points, where they are picked

Continued on page 395

* President, Industrial Fire Chiefs' Association of New Jersey; retired fire chief, Esso Bayway Refinery.



Shattered rubble remaining on morning after explosion is mute evidence of blast force. Tangled and twisted steel girders, wood roof joists, concrete floor slabs and heavy concrete blocks impeded efforts of firemen to recover victims buried under heavy debris—*Tarby photo*

Filling Station Explosion Kills Three Firemen

Assistant Chief William Maywalt directs recovery effort as fire department chaplains look on. Tangled mass of heavy rubble and flames from burst natural gas line slowed operations—*Tarby photo*

GASOLINE VAPOR in an Auburn, N. Y., service station lubritory exploded on March 30 while three members of Engine Co. 4, Auburn Fire Department, were employing a 2½-inch hose line to wash down the basement in the one-story building. Lieutenant Alfred H. "Spuds" Murphy, Driver John F. Searing and Fireman Anthony T. Contrera died on the spot. The operator of the station was fatally injured and an employee of an oil distributing company also died in the blast.

The 32 by 40-foot concrete block station located one block south of the main business district center of the city was ripped apart and several pieces of concrete block and slab debris pierced the gypsum plank roof of an exposed theater to the north. Leaded glass windows comprising 35 to 40 per cent of the wall area of a church exposed to the south were completely sucked out toward the blast indicating the main force was upward. Windows of facing exposures to the east and west were broken and numerous plate glass show windows of stores within a one block radius were shattered. Practi-

cally no interior damage was caused to the exposed buildings.

Chief Luke J. Bergan told FIRE ENGINEERING that at 7:30 p.m. Assistant Chief William Maywalt dispatched Engine 4, commanded by Murphy, to investigate a report of gasoline fumes in a filling station at the corner of South and Lincoln Streets. About 20 minutes later an explosion was heard and a radio call for help was received at 7:52 p.m. by the Cayuga County Control Center fire alarm operator, located at Auburn Fire Headquarters. At about the same time a box alarm was received. Engines 1, 2 and 3 and Truck 2 responded and found the gasoline station leveled and flames spurting from a burst natural gas service which led into the basement to supply fuel for two overhead space heaters and a hot water heater in the building.

The only surviving member of the company at the scene, Fireman Sidney Burridge, told Chief Bergan that several inches of gasoline had been found in the basement of the station. A 2½-inch line had been stretched from a nearby hydrant. The company entered the basement through a small floor hatch and employing a fog nozzle had begun washing down the area. Burridge was ordered to obtain a hose strap from the apparatus and was approximately 30 feet from the building when the explosion occurred. Although knocked down and in a state of shock which later required his hospitalization, Burridge regained his feet and reached the parked pumper where he radioed for help. He then attempted to reach the trapped men, but was burned about the face and driven back by flames, apparently from burning natural gas escaping from the ruptured service.

Members of the companies responding to the radio alarm quickly pulled the station operator from the rubble. He died later at a hospital. Water fog and foam were employed on the flames while the fire fighters labored to reach the remaining victims under the debris. All off-duty firemen reported to the scene within minutes after the blast to assist in recovering the bodies.

Hose streams were later used only for cooling purposes when it was determined that the fire still emanating from the debris was from the ruptured gas service. The curb shutoff for the gas main was buried under the debris and required several hours to locate.

Due to the destruction, Chief Bergan doubts that the actual cause of ignition of the fumes will ever be ascertained. He is inclined to believe that an air compressor motor located in the station started automatically and created an arc which triggered the explosion.

The gasoline in the building is believed to have come from a leaking underground tank. The filling station had occupied the site for many years and had a pit-type grease rack. It had been remodeled in recent years, but the basement area was retained.

Murphy was a veteran of 23 years service having been appointed to the department in 1937. For several years he was Chief Bergan's driver and aide before his promotion to lieutenant in 1958. Searing and Contrera were appointed in 1957. □□

Auburn fire fighters use bare hands to reach body of John Searing. Kneeling in foam-covered debris is off-duty Captain Bernard Searing, cousin of the victim —Citizen Advertiser photo by LaVerne G. Moe

BAYWAY REFINERY

Continued from page 392

up by trucks designated for that job and taken to the scene of the fire. At the same time, the fire co-ordinator concentrates on over-all efforts to fight the fire, diverting feed stocks and designating units to be pumped out if they are in danger.

The volunteers report directly to the firehouse, where they are equipped, receive special instructions and taken to the fire in large dray trucks, which converge on the firehouse when the alarm sounds.

When alerted by radio, each straddle truck driver in the vicinity of the fire picks up the nearest tray of foam powder and drives it to the fire; other straddle trucks report to the fire station. These vehicles are used to transport foam columns, if needed, and other equipment.

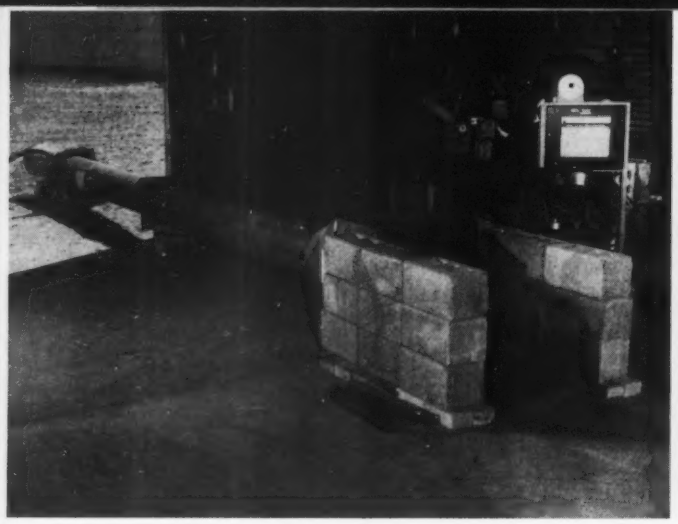
The rescue truck and ambulance respond to the alarm, usually arriving at the fire at the same time as the fire brigade and the first firemen. The fire is attacked and extinguished according to prescribed methods, depending on its type and extent.

Fire prevention and maintenance

Ability to rapidly extinguish refinery fires, important as it is, is no more vital than effective fire prevention through sound maintenance and housekeeping practices. Many of the policies in Bayway's fire fighting program apply equally well in maintenance activities—particularly where employee safety is involved. For example, coked burners or leaky exchangers and pipelines may "flare" without warning, endangering any maintenance personnel engaged in repairs.

Several maintenance men recognized the value of proximity suits during their fire fighting training and began to borrow them from the fire department for maintenance and repair jobs. With the suits, in-service maintenance is possible because they reflect 90 per cent of radiant heat and guard against splash. The suits are now regular maintenance equipment.

With trained fire fighters in each department, Esso Bayway has achieved a level of safety consciousness that otherwise would be unattainable. In addition, the fire protection policies have led to improved maintenance procedures with a positive effect on increased production. □□



1. *Filter fire destruction test apparatus employs venturi air mover at extreme end of duct. Motive power is supplied by a large portable air compressor*

2. *New fire-retardant filter in position for fire destruction test. Six thermocouple leads are attached to filter and connected to a multiple-temperature recorder*

Developing fire-resistant high-efficiency air filters

By J. H. PALMER
General Electric Company

TODAY'S PLANT MANAGERS requiring cleaner air in manufacturing facilities, are turning more and more to high-efficiency space-type filters as now used in many exhaust systems for this country's atomic energy plants. Atomic plant engineers have found that space filters, with an efficiency of at least 99.55 per cent in removing submicron particles from the air streams, are the most efficient dry-type filters now available.

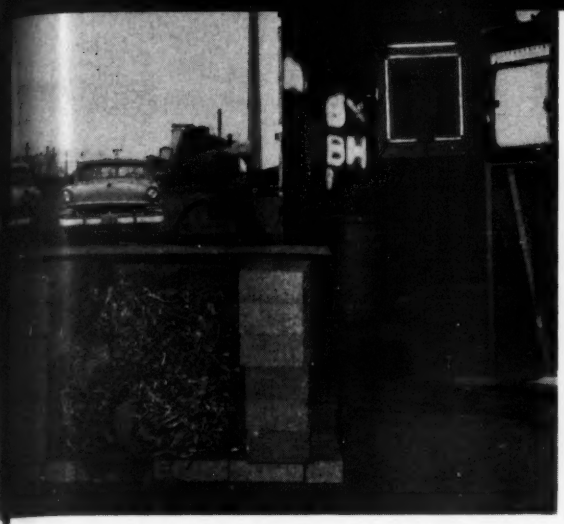
Extremely important to the atomic energy business, as a means of protecting environmental areas against possible contamination by filtering exhaust stack gases, this high-efficiency filtration is also necessary to supply clean ventilation air to pharmaceutical houses, photographic equipment and textile manufacturers, movie studios, breweries, food-processing plants, art and manuscript depositories, vaults, etc., where airborne contaminants would affect purity of product.

The original space-type filter, first used in atomic energy plants in 1947, had one serious flaw—it was a fire hazard. The filter as then constructed was of untreated plywood, thin corrugated paper separators, and the medium—soft felt-like asbestos-bearing cellulose paper. The unit was designed for disposal by incineration.

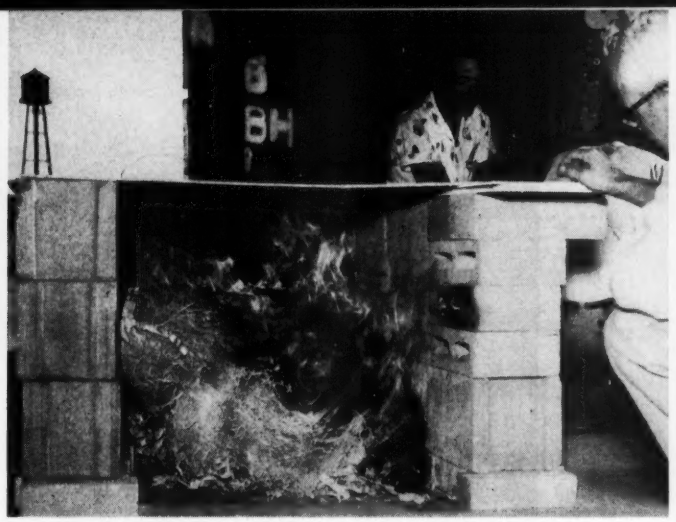
This filter was known as CWS-6 and later as AEC-1, and when in service was almost a perfect combination of air and burnable materials. From a disposal point of view, this was excellent, but it created a serious fire hazard and protection problem.

5. *The firing material approximately half consumed. Note smoke leaving the venturi, indicating that the filter has already broken through*

6. *Front face of the fire-retardant filter after test. Daylight could be seen through approximately 90 per cent of the filter. Separators are still in fair condition*



3. *Filter ready for firing. Direct contact of firing material to the filter is avoided by placing wire mesh screen 6 inches from the filter face*



4. *Seconds after the start of the test. Throughout the test, flow through the filter was maintained at 1,050 cfm, with velocity at 260 ffm*

Engineers at the Hanford plutonium manufacturing plant (which GE operates for the Atomic Energy Commission), recognized the hazard of these filters early after their adoption. It was found that a fire, once started, was practically uncontrollable. Carbon dioxide applied to a filter in place had practically no effect; neither did copious amounts of water. It was necessary for the element to be removed from the frame and be literally torn apart before the fire could be extinguished.

This experience proved beyond a doubt that a fire-resistant high-efficiency filter had to be found. The first major step in this direction was made during 1951-52, when a noncombustible fiberglass and asbestos-fiberglass medium was developed, and submitted for test purposes to the engineers at Hanford.

Following this, flame-treated paper separators were developed, then fiber-

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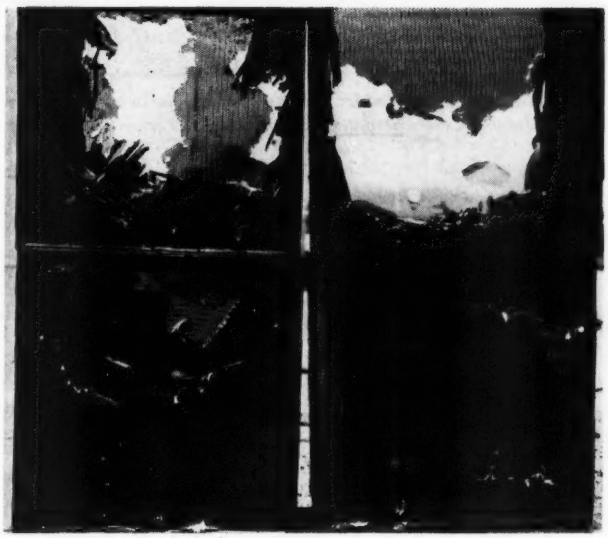
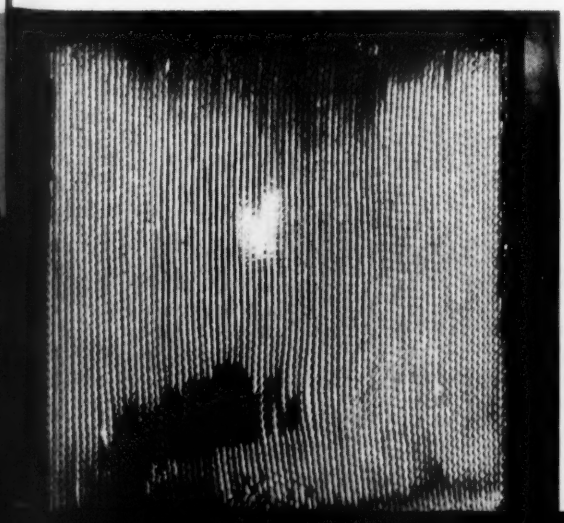


9. *C.W.S.-6 filters after comparison burning tests. Heat seriously damaged discharge end of test apparatus and completely destroyed filter media and separators*

7. *Rear face of fire-retardant filter after test. Flashlight held behind filter accentuates the break-through. Separators are still in fair condition*

8. *Filter torn apart for inspection after the fire test. Filter media has disintegrated; separators are very brittle but in formation, except where burning adhesive damaged them*



Heavy streams from turret pipes and ladder nozzles were unable to save the hotel once fire had involved it. Delayed discovery and poor standpipe pressure permitted its spread—*FDNY photo by Heffernan & Hellriegel*

Inadequate water pressure dooms Long Island hotel

IN ITS SUNNY HEYDEY, the Nautilus Hotel at Atlantic Beach, N. Y., cast its shadow on the nearby Atlantic Ocean. Yet when it burned on March 14, water supply was a major problem.

Built around 1929, the Nautilus was a seven-story building, approximately 170 x 100 feet. A two-story penthouse on the roof provided living quarters for the employees. Construction was brick on steel frame, and interior partitions were wire lath and plaster on fiber board. There was considerable wood trim within the building. Three elevator shafts, an interior fire tower and a stairway were masonry-block-enclosed. Two laundry chutes were sealed off at all floors with the possible exception of the second floor.

A standpipe system, supplied by city main and fire department connection, covered the floors from one through seven. When the building was erected, a sprinkler system was installed in the basement, supplied by city main and fire department connection. Later, to comply with the multiple residence law, a sprinkler system was installed to cover the penthouse, seventh-floor corridor and stairway. This system was supplied from an 8,000-gallon roof tank. It is reported that, at the time of the fire, this tank was empty and that a battery-operated H.A.D. system was not operative.

The fire is believed to have started in the penthouse apartment of a night watchman, and apparently was caused by an electric heater that had no switch or thermostat. There was no one in the penthouse area at the time, and the fire was not discovered until three workmen several blocks away noticed it. They called the fire department and hurried to the hotel to warn its occupants. The workmen and several hotel employees attempted to extinguish the fire with standpipe hose from the seventh floor but the pressure was inadequate.

The Inwood Fire Department received the alarm at 8:55 a.m. Thirty men responded with four pumpers (two 1,000 gpm, one 750 gpm and one 500 gpm); an 85-foot aerial ladder, an emergency-floodlight unit and an ambulance. Following standard operating procedure as set up in prefire planning, a mutual aid call for an aerial ladder and pumper from Lawrence-Cedarhurst was sent out immediately.

Fire was found involving two apartments on the seventh floor and in the sixth-floor ceiling. The Inwood fire fighters stretched two standpipe lines from the seventh floor and one 2½-inch line up the aerial ladder. They failed to obtain operating pressure in the standpipe system, and gradually increased the pressure on the pumper to 350 psi without success. An attempt to improvise an exterior standpipe line using 3-inch hose failed because orders to support each coupling with roof ropes were not followed.

The fire's spread on the seventh floor and roof endangered the crews operating there and they were ordered to back down. It was planned to make an inside stand on the fifth floor. While the situation was being sized up, the ballroom and lobby on the second floor burst into flames. All personnel were then ordered out of the building.

Meanwhile, after Lawrence-Cedarhurst was called to the fire, calls were sent out for mutual aid from other departments in the Nassau Third Battalion. Woodmere responded with a

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In your Community . . .

Are school fire drills purposeful or perfunctory?

By EMMANUEL FRIED*

SINCE THE CHICAGO school fire, efforts to increase fire safety in schools have multiplied. No one can question that there have been great improvements. It is only tragic that the loss of so many lives had to be the motivation for such changes.

However, the regular school fire drill has perhaps not received sufficient attention. Regarded by some school authorities as a necessary evil, in some localities it has become a stereotyped requirement of local law. Yet the school fire tests conducted by the Los Angeles Fire Department emphasized the need for prompt notification and rapid evacuation, particularly since smoke may make a floor or area untenable within minutes after the fire starts.

It may be relevant, first, to define a fire drill. It is "the orderly, systematic, rapid evacuation of a building on fire, in danger of taking fire, or for any other valid reason, by its occupants to a point of safety."

To achieve this end, an efficient fire drill organization plan must previously have been established, with duties and responsibilities clearly designated. It must constantly be kept in mind that no building is completely fire safe. There are relative degrees of fire safety but no one can give a guarantee in this field. Consequently, if there is the slightest hint of unexplained smoke or heat, the school should be evacuated, the fire department called and the students not allowed to return until the fire department declares the building safe. The less fire-resistive the building, the greater the need for such extreme precautions. Whoever sounds the alarm under such circumstances may be criticized by shortsighted persons, but this criticism is vastly preferable to a school disaster.

Assuming that all schools hold regular fire drills, how can these drills be made more effective?

1. *The psychology behind the average fire drill is wrong.* As a rule, principals and teachers know about a drill in advance and hence tend to feel they are play acting. This type of drill does not give sufficient practice in the unusual or spontaneous activating of emergency procedures. Inspecting officials should, without any advance warning, sound the interior alarm. If possible, such officials should have with them one or two trained observers, so that behavior patterns and results may be checked on different floors simultaneously. "Dismissal type drills," wherein children are sent back to their home rooms for a few minutes before regular dismissal, instructed to get dressed, and then wait for the alarm bell, are not a real test of emergency evacuation procedures. Whenever possible, drills should be as realistic as possible. This means not stopping for protective clothing. Except rarely, there will be at least one day during the month sufficiently mild to permit the children to be exposed for the few minutes necessary to empty the school. Probably some of the parents will gripe about exposing the children, but remember this: These children are rehearsing for a performance where there may be no second chance if the first performance is not right.

2. *Reliance upon public address systems.* While public address systems are helpful, alternate plans must be made because in case of fire, electric current may fail and render the system useless, or the officials may be at the remote end of the school from the transmitter at time of emergency.

3. *Night drills.* Many schools have varied night activities such as night classes, local P.T.A. groups, dances, basketball games. Have plans been made to cover such activities in the fire drill organization plan? Has a fire drill ever been carried out under such conditions? Are provisions made to light courtyards, emergency exits, fire escapes when school is used at night?

4. *Physically limited children.* Special provisions should be made for physically limited children:

(a) Have all such assigned to one school of safest construction and on street floor

(b) Assign special monitors to aid these limited children in time of emergency

(c) Try out in advance special carries and holds to make such evacuation easier.

5. *Fire escape use encouraged.* Use of all emergency exit stairs and fire escapes is desirable during drills in order to familiarize students with these means. It also serves as a valuable check up of the maintenance, suitability, and readiness of these emergency features.

An important requirement of the NBFU and many state education laws is the use of wired glass in windows on course of and within 10 feet of fire escapes. This is extremely important because should fire break through the window and expose the fire escape above or alongside, it would make the escape impassable or dangerous. If children were already on the fire escape and coming down, they could be burnt to death. Wire glass in metal frame and sash resists fire and will stay in place much longer than plain glass. Therefore, when such protection is lacking, it may be wise for the responsible school official to determine alternate means in advance should these vulnerable areas be threatened. It is also particularly necessary that when wired glass protection has been installed, persons be specially designated to close such windows, should they be open in case of warm weather. Otherwise they are useless.

6. *Frequency of drills.* There should be a minimum of 12 drills per school year, at least eight of which should be held by December 31st of each year. Thereafter, drills should be held at least once monthly. This will give a greater amount of practice when it is

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*Fire chief of Hinsdale, Ill.; formerly president of Gardwell Company, fire safety consultants; retired deputy chief, New York Fire Department.

Administration of Fire Department Manpower

A condensed analysis and report by the International Association of Fire Chiefs

Part I - Organization Structure

This series is based on excerpts from a report by the I. A. F. C. Committee on Classification and Examination given at the 1959 conference in Grand Rapids, Mich. The committee is composed of Henry J. McFarland, director of municipal service, New York State Department of Civil Service; Chief Irving D. Merrick, Poughkeepsie, N. Y.; and Edward J. MacDonald, public safety commissioner, White Plains, N. Y., and president, Eastern Association of Fire Chiefs. In this installment recommended duty statements of the various fire fighting positions are detailed. In the next part, recruitment, induction, orientation and training of personnel will be outlined. In addition, competitive examinations and employee relations will be considered.—The Editors.

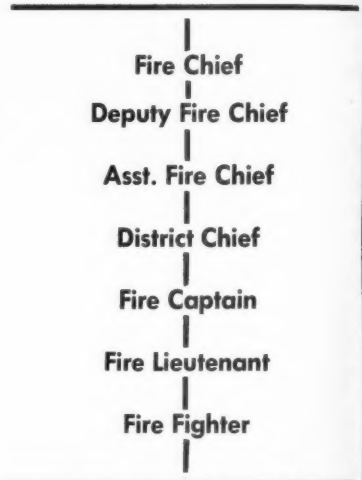
SERIOUS CONSIDERATION has been given by the Committee on Classification and Examination to the kinds of jobs found in fire departments, as well as the organization structures. Attention was first turned to the firemanic positions to study the knowledge, skill and ability requirements of each occupational level, together with its responsibilities and authority in relation to the other positions of the department. The auxiliary positions have been separated from the truly firemanic or fire fighter positions. Many of these positions are highly necessary to any effective fire fighting force, but the numbers and kinds will vary in accordance to the size of the fire departments and communities.

Basically, the simplest organization is a group of fire fighters led by a fire chief. The National Board of Fire Underwriters staffing requirements for various kinds of apparatus were useful in determining command requirements and limits. It is believed that as an organization grows the first command position most likely to be created in addition to the chief is that of *Deputy Fire Chief*. It is recommended that this position be spelled out in the same terms and require the same complex of knowledge, skills and abilities as that of the fire chief. A deputy is expected to have generally the same training and background in the fire service because he is to take command in every sense of the word in the absence or disability of the fire chief. For this reason, the second in command should always be titled deputy fire chief and this title should be honored in the same way as that of fire chief.

Probably the next most frequently created position is *Fire Lieutenant*, because it is the opinion of a unanimous majority of chiefs that a group of fire fighters on a rig of whatever nature must be under the command of an officer. Thus when several companies are put together, we have the need for a *Fire Captain*. It is interesting to note here that there is some trend throughout the United States and Canada to discontinue the use of lieutenant and use only the captain designation. The conditions of any organization may seem to favor this, yet the Committee believes that there is a lot of good sense in having a fire officer in charge of any piece of apparatus.

When the need for a higher command position was felt in some of the larger fire departments, there was a natural development to fall back on the army nomenclature and use the term *Battalion Chief*. The Committee believes, and the trend seems to indicate that actually a better name for this position is *District Chief*. After due deliberation, the Committee adopted the title to designate that person who has a district or area under his command and is responsible for a number of stations and a number of different companies.

In highly organized structures, there is a need for the title of *Assistant Fire Chief*. There is a preference in some organizations to call this *Assistant Deputy Fire Chief*. This level of position should be instituted where a department is large enough to have a special unit for training, arson investigation, fire inspection work, or for the actual tactical fire fighting head of the department where the three-platoon system is in effect. There is a growing body of opinion that in departments large enough to be organized in districts, the tactical fire fighting responsibility should be the district chief's in whose area the fire occurs.



Specifications have been drawn up for these positions. They have been critically considered and many suggestions have been incorporated in their development. These may be used in comparing specifications to any department. The Committee is positive in its belief that all departments should have job specifications for each position in its organization. These should be available for inspection by men and officers, and where a formal personnel system is employed, it is generally the function of the civil service agency to do the classification.

However, it does not relieve the fire chief of the responsibility for bringing to the attention of the central personnel agency the knowledge, skills and abilities which are required in the men and officers who make up a department. Conditions change, organizations change, new types of fires require new types of handling, and whenever the specification does not adequately reflect the duties, responsibility, knowledge, skill and ability necessary for the job, it is incumbent upon the chief to either change it or take it up with the personnel agency to see to it that the specifications do adequately reflect the position.

Recommended Duty Statements

Fire Chief: Has responsible charge of over-all fire prevention and fire fighting activities. Plans, coordinates and directs the activities of the fire department; does related work as required by circumstances.

This is important administrative firemanic work involving responsibility for planning and coordinating the activities of, and for the condition and efficiency of all fire fighting units. Work is performed under administrative direction in accordance with established policies permitting considerable exercise of independent judgment in directing the activities of the fire department. Work is reviewed through conferences and reports.

Examples of work: Reports to and assumes command at all major fires and extraordinary emergencies. Plans, coordinates and directs over-all activities of all fire fighting units. Assigns men to perform specialized fire fighting and fire prevention duties. Supervises investigation and determination of causes of fires. Directs inspection of buildings to insure compliance with fire prevention ordinances.

Maintains discipline and promotes the morale. Reviews reports and makes inspections to determine condition and efficiency of all fire fighting units. Takes measures to correct deficiencies when they occur. Directs and inspects maintenance and repair of all fire fighting equipment. Directs preparation and maintenance of personnel and activities records and reports. Directs training of fire department personnel. Prepares and presents annual budget.

Consults with superiors regarding major policy determinations. Recommends purchase of supplies, procurement of equipment and replacement of deficient fire fighting equipment. Attends meetings and conferences and addresses interested groups regarding fire prevention and fire fighting activities. Studies and sets up plans for dealing with possible conflagrations and other emergencies. Initiates and develops public relations policies.

Required knowledge, skills and abilities: Comprehensive knowledge of modern fire fighting and fire prevention methods and equipment. Thorough knowledge of state and municipal building code and fire prevention laws and regulations. Thorough knowledge of geography, building conditions and major fire hazards of the municipality. Thorough knowledge of safety precautions used in fire fighting. Thorough knowledge of current trends regarding administration, fire fighting and fire prevention activities. Demonstrated ability to plan, coordinate and direct fire fighting and fire prevention activities. Ability to maintain discipline and promote morale. Ability to develop cooperative relations with the public. Initiative, resourcefulness, dependability, sound judgment in emergencies. Good physical condition.

Experience and training: One year of satisfactory permanent service as an assistant fire chief and graduation from a standard senior high school, or any equivalent combination of training and experience sufficient to indicate ability to do the work.

Assistant Fire Chief: Has responsible charge of the activities of all units within an assigned division; does related work as required. This is important supervisory work involving responsibility for coordinating and directing the over-all activities of and for the condition and efficiency of all fire fighting units within an assigned division. Work is performed in accordance with established policies and requires exercise of good judgment in emergencies. A high degree of responsibility for the protection of lives and property is involved.

Examples of work: Responds to all fires within assigned division and assumes command of over-all fire fighting activities. Directs operations and deployment of all companies within the division. Investigates and, if possible, determines the causes of fires and submits detailed reports. Immediately notifies the chief regarding all major fires and unusual happenings involving loss of life, injuries to persons and damage to property resulting from accidents at scenes of fire or in responding to alarms.

Submits detailed reports regarding all accidents at fires or in responding to alarms. Supervises inspection of buildings within assigned division and insures compliance with fire prevention regulations. Reviews building inspection records and inspects dangerous or unusual conditions. Makes periodic visits and inspects company journals, records, apparatus, hose, tools, uniforms and other equipment to insure proper conditions. Reports all defects and deficiencies found to exist.

Details officers and men when necessary to equalize companies. Investigates and reports violations of regulations and dereliction of duty. Supervises the preparation of and submits personnel and activity reports. Assists in the over-all administration of the department. Directs the training of subordinates. Studies and sets up plans for dealing with possible conflagrations and other emergencies. Implements and promotes public relations for the department.

Required knowledge, skills and abilities: Thorough knowledge of modern fire fighting and fire prevention methods. Thorough knowledge of fire prevention laws and regulations. Thorough knowledge of geography, building conditions and major fire hazards of the municipality. Thorough knowledge of safety precautions used in fire fighting. Good knowledge of fire training techniques. Ability to maintain discipline. Ability to recognize fire hazards. Demonstrated ability to direct and coordinate fire fighting activities. Resourcefulness, sound judgment. Good physical condition.

Experience and training: One year of satisfactory permanent service as a district chief and graduation from a standard senior high school, or any equivalent combination of experience and training sufficient to indicate ability to do the work.

District Chief: Has charge of the activities of all fire fighting in an assigned district. Does related work as required. Employees in this class are generally responsible for overseeing proper maintenance of fire stations and equipment, and proper supervision of all fire companies within his district. The district chief responds to all fires within his district and commands all companies until relieved by a superior officer.

Examples of work: Responds to alarms within his area and of such other fires as he may be called in accordance with established procedures. Relieves fire captains of command

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Elevator poses hazard during San Francisco alarm

A discussion of the safety features of modern self-closing doors and recommendations by the industry

AN AUTOMATIC ELEVATOR—the type that has supplanted operator cars in many new buildings—nearly contributed to the death of two persons at a recent fire. At a greater alarm in a downtown San Francisco building in January, three building employees, probably out of curiosity, rode the elevator from the ground floor to the fourth floor which was the scene of the fire.

As the car doors opened automatically, intense smoke rushed into the car and momentarily confused the three occupants. Pushing the button to close the doors and return to ground level resulted only in successive partial closing and reopening of the doors.

One occupant remembered a stairway some 12 feet away and escaped by this exit. The other two, still panic-stricken, did not follow but called for help. A member of the rescue squad heard and located them. He calmed them and led them to the safety of the stairway. Later at street level, both required oxygen.

Chief of Department William F. Murray, who reported the incident to FIRE ENGINEERING, discloses that, since no mechanical defect was found in the equipment, it is presumed that the smoke was sufficiently dense to break the beam which controls the door-closing mechanism. During his investigation, Chief Murray was advised that a flashlight directed at the "eye" would have closed the door. While it is farfetched to expect all building occupants to carry flashlights for such emergencies, this may be a valuable "tip" to fire fighters. However, this technique may not work at all cases since installations vary in operational features.

G. H. Reppert, code engineer for the National Elevator Manufacturing Industry, Inc., in reply to an inquiry from FIRE ENGINEERING, confirmed that dense smoke would cause the light-ray reopening device to function by obstructing the ray and causing the door to successively open and close, preventing the car from leaving the floor.

Mr. Reppert also pointed out that one of the larger elevator companies which uses this type of protective device arranges the door control circuits so that if the doors remain open more than a predetermined number of seconds, they will close and permit the elevator to start and leave the floor. This will happen even if the light in the light-ray protective device continues to be obstructed. This is done because otherwise a person standing in the doorway talking to a person in the car, or for any other reason, could keep the car shut down for a long time. Had this arrangement been used in the building in question, the car would have been held at the fire floor for only a few seconds no matter how dense the smoke was.

Two other types of elevator door reopening devices are used. One employs a safety shoe mounted on the leading edge of the door panel which will, if it is obstructed, cause a closing door to reopen and remain open as long as it is obstructed. The other device is an electronic type and causes a magnetic field to be set up extending from the top of the door to the bottom for a distance of about 4 inches in front of the leading edge of the door. When a person intersects the magnetic field, the door reopens. Smoke would not cause either of these devices to function to reopen the door. In both cases the door control system is arranged so that if the door is held open by a person standing in the doorway more than a predetermined number of seconds a buzzer will sound in the car and at the starter's station and will continue to sound until the person ceases to obstruct the door.

It is apparent from the preceding that, had the light-ray device been properly constructed in the elevator in the fire building, the car could not have been held at the fire floor.

Some building codes permit elevators to be classified as required means of egress, replacing a specified percentage of the required stairway exits. As a result of recommendations by the National Elevator Manufacturing Industry, the later editions of the Building Exits Code of the National Fire Protection Association have prohibited elevators from being classified as any part of the required exits. This is applicable not alone to automatic operation elevators but also to what are known as signal operation elevators, equipped with power-operated hoisting doors. This also applies to any type of operation, employing an operator in the car, which is arranged to stop automatically at landings where a waiting passenger has pressed the landing operating device, and at landings where the operator in the car stops it either by pre-pressing stop buttons in the car, as in signal operation, or by means of the operating switch in the car.

The National Elevator Manufacturing Industry is opposed to rating elevators as required exits because if a fire occurs on a floor in a building, one or more elevators may have stops set up for that floor. If the fire is severe and there is a large amount of smoke and hot gases, these will enter the car when it stops and the doors open and may be severe enough to kill the persons in the car even if the doors closed again in a few seconds.

Mr. Reppert suggested the desirability of requesting the responsible agency to issue a safety order to require that where a light-ray protective device is used on power-operated elevator hoistway doors, it must be arranged to permit the doors to close if the ray is obstructed for more than a predetermined number of seconds, by any means. □□

Bone-tired... and off you go again

All of us know that the time of day or night means nothing to the fireman. Often he works double his normal tour time, or even more.

Bone-tired though he may be, there can never be any delay, for time is deadly. Even just a few lost minutes can mean destruction and death. We at Eureka Fire Hose are pleased to help cushion the fireman's job, to help make his task a little bit easier by providing him with hose that is one-third less in weight than conventional hose.

At the same time, Eureka is the completely safe hose that handles up to 600 pounds pressure. Its smooth interior ply insures highest nozzle pressure. And once back from a fire, Eureka helps the fireman with his housekeeping. Eureka's Exclusive Multiple-Woven Hose dries more quickly; there is no space between jacket plies to collect dirt and water. It stores away easier and takes up much less space.

Eureka is the hose the fireman can rely on all the time, all around the clock, to make his rough job easier.

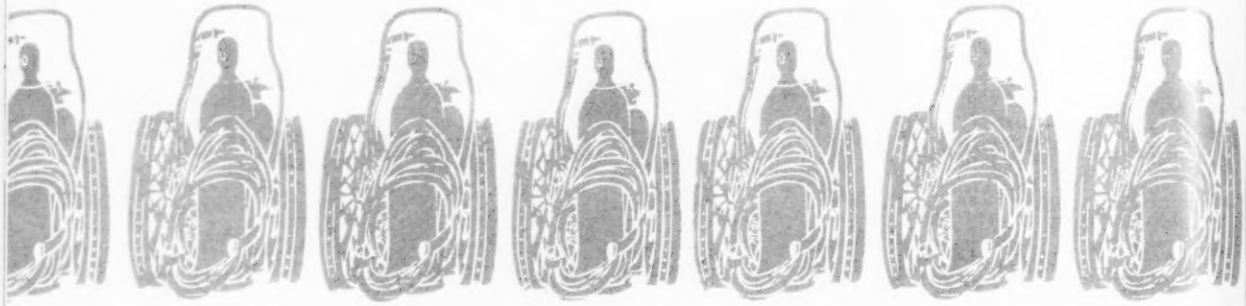
"For greater protection to life and property"

EUREKA FIRE HOSE

Since 1875, Specialists in Manufacturing Circular-Woven Rubber-Lined Fire Hose

1 Market Street • Passaic, New Jersey

Division of **United States Rubber**



This fire extinguisher, Ansul's HF 350-B, has just been granted the highest fire-killing rating ever awarded by Underwriters' Laboratories—160 B:C. It's an achievement symbolic of Ansul's continuing leadership in fire research... a milestone in the never-ending search for new ideas, new products for better fire protection.

Your local Ansul Man is a trained fire protection expert, available to survey your plant and counsel on your fire protection requirements. We invite you to call on him (he's listed in the Yellow Pages) or write directly to ANSUL CHEMICAL COMPANY, Marinette, Wisconsin. We'll be pleased to send our new fire equipment catalog, describing the complete Ansul line of hand portable, wheeled, stationary and mobile fire extinguishing equipment and automatic systems.

ANSUL

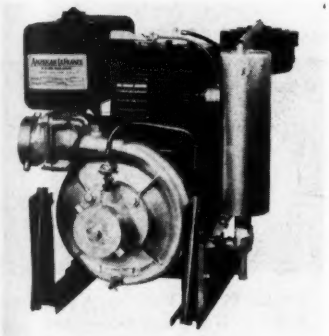
ANSUL CHEMICAL COMPANY • MARINETTE, WISCONSIN | FIRE EXTINGUISHING EQUIPMENT • REFRIGERATION PRODUCTS • INDUSTRIAL CHEMICALS

WHAT'S NEW

Among the Manufacturers

- products
- processes
- personalities

New LaFrance Portable



American LaFrance, Elmira, N. Y., announces its Model DC volume-pressure portable pump. Said to weigh 130 pounds, it is rated up to 250 gpm at 15 psi and is powered by a 9-hp Briggs and Stratton 4-cycle engine. It is equipped with an exhaust primer and 2½-inch suction and discharge ports.

Pontiac Amblewagon

Pontiac Motor Division of General Motors Corp., Pontiac, Mich., is now offering ambulance conversions for its station wagons. Available on special order through local dealers, all accessories and necessary interior installation is provided by the Automotive Conversion Corp., Birmingham, Mich.

School Alarm System

Scam Instrument Corp., 1811 Irving Park Road, Chicago 13, Ill., recently installed an alarm system in Park Ridge, Ill., which monitors 10 community schools from the central fire station. Automatic fire detection sensing units located throughout each school in the system are connected directly to the fire station supervisory unit. The detectors are supplemented by manual pull boxes located in halls, offices and classrooms of the buildings. System component, transmission line or power supply failure will also cause an alarm, it is claimed. Scam built the fire station monitor unit while fire detection devices and over-all system design was furnished by Standard Electric Time Co., Springfield, Mass.

American Fire Apparatus Expands Facilities

American Fire Apparatus Company, Battle Creek, Mich., has expanded production facilities at its Marshalltown, Iowa, plant, just south of that city on Highway 30. This increases factory space 50 per cent and is the second expansion since the Marshalltown plant was established in 1955.

ADT Moves Chicago Office

American District Telegraph Company has moved its Chicago sales, plant and accounting offices to new headquarters at 175 West Jackson Boulevard, Suite A-1024. The new office includes a studio which is equipped to give working demonstrations of the company's electric protection systems. None of ADT's five Chicago central stations is affected by the relocation.

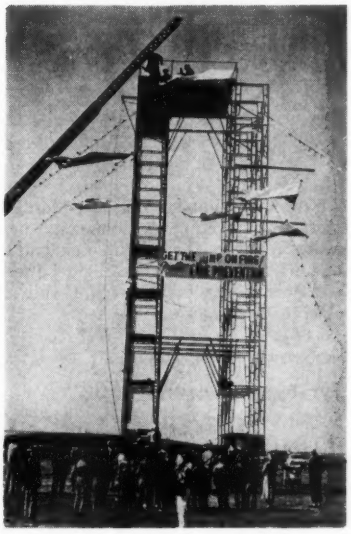
Snyder Buys National

M. L. Snyder & Son, Inc., Jasper and York Streets, Philadelphia 25, Pa., has announced purchase of the entire business of National Fire Protection Co., West Chester, Pa. Snyder will continue to service its customers on the same high standard as in the past.

New Squad Unit

The Gerstenslager Co., 1425 East Bowman, Wooster, Ohio, recently delivered this 14-man squad car on a GMC No. 450 chassis to the Hill Top Hose Co., Natrona Heights, Pa. It features a removable partition and doors from the sliding rear section which telescopes into the forward body section. The latter affords an open unit in favorable weather. The body and cab sections are heated with independent hot water heaters and insulated with Fiberglas and aluminum foil. A special indicator light on the dash panel warns the driver if any compartment door is left open.

Steel Drill Tower



Safway Steel Products, Inc., 6234 West State Street, Milwaukee 13, Wis., has developed a tubular steel scaffold drill tower for training and public demonstrations. It is claimed the parts can be quickly assembled with quick fasteners into towers of virtually any height and base area without use of tools.

New Fire-Lik Concentrate

Deynor Corporation, 1 Depot Plaza, Mamaroneck, N. Y., announces the introduction of Fire-Lik wet water liquid concentrate. It is said to be formulated for use with any standard line proportioner, or eductor, for ½ to 1 per cent pickup.

The liquid form of Deynor's cartridge concentrate, Fire-Lik, is claimed to reduce the surface tension of ordinary water from the normal 72 dynes to approximately 30 dynes per centimeter at only ½ per cent solution. It is said to be compatible with either fresh or salt water.

Spear and Co. Acquires Acme-Hamilton

Spear and Co., New York, announced on January 18 that it had acquired Acme-Hamilton Mfg. Co., Trenton, N. J., in exchange for 2,266,000 shares of Spear common stock. Acme makes fire hoses, mechanical rubber goods and conveyor belting. Spear operates three retail stores under the name of Ludwig-Baumann-Spears. The name of the combined firm will be Acme-Hamilton.

Please turn page

Koehler Commando Light

Koehler Manufacturing Co., Marlboro, Mass., is marketing its Commando light, Model 285. Designed to clip on a belt, the unit uses four regular flashlight batteries and includes a built-in spare bulb for emergency purposes.

Fyr-Fyter Protects "500"

The Fyr-Fyter Co., 221 Crane Street, Dayton 1, Ohio, will once again furnish all fire protection equipment to the 1960 running of the Indianapolis Memorial Day "500" auto race. The company has for a quarter of a century annually supplied this material as a public service for the auto classic. Each pit area is provided one 50-pound CO_2 and two 15-pound CO_2 extinguishers. In addition, dry chemical extinguishers, foam and other equipment is supplied to the track's private fire department for use on apparatus deployed throughout the stands.

Mack-Magirus for Chicago

Mack Trucks, Inc., Plainfield, N. J., recently delivered two 144-foot and two 100-foot Magirus aerials to the Chicago Fire Department. Mounted on B-85F chassis with 276-hp engines, the units are equipped with power steering and air brakes. The six-section, 144-foot ladders are the first of their type to be mounted on Mack chassis and are said to provide a unit of 34 feet over-all length.

Buys Buckeye Line

Machine Products Corp., 125 Hollier Avenue, Dayton 3, Ohio, has purchased the well-known "Buckeye" fire department equipment from the Buckeye Iron and Brass Works, Dayton, Ohio, and will manufacture and market the line as well as additions. The company states the same high standards of quality will be retained.

Marks 25th Anniversary

The Penetone Co., Tenafly, N. J., is now observing its 25th anniversary. The company which manufactures an emulsifier-detergent for dispersing gasoline spills began in 1935 as a one-man operation. Today it has an affiliate plant in Sweden, a substantial interest in an English company and representatives in more than 10 other foreign countries.

Notifier N-CO-Stat

Notifier Corp., 3700 North 56th Street, Lincoln 4, Neb., has announced a new fire-detection thermostat which is said to fit a standard electrical outlet box. A self-restoring fixed-temperature unit, it is claimed to be waterproof and airtight. Listed by Underwriters' Laboratories, they are available in 135° F., 190° F., and 250° F. temperature ratings.

Please turn page

WANT HELP IN PLANNING YOUR EMERGENCY RESCUE UNIT?

GET YOUR COPY NOW!
New brochure contains a check list of the most needed equipment carried by fire-rescue vehicles. Also illustrates and describes a wide variety of body styles and sizes. Really helpful in starting your plans.

call on

GERSTENSLAGER'S

experience without obligation

It takes good team work to plan, design and build the best and most effective Fire-Rescue unit for your community. You're the team captain. You and your Gerstenslager Sales Engineer examine the requirements—lay the basic plans. Next—our experienced engineers develop the details and complete the design. Finally, after approval, your community receives a life-saving vehicle that exactly fills the need. Write, wire or phone for details.

CUSTOM BODIES SINCE 1860

THE GERSTENSLAGER COMPANY, 1425 EAST BOWMAN, WOOSTER, OHIO

OVERCOME BY SMOKE!

This kind of headline will *not* be printed
when — all — Firemen — use — their own
ACME FIREMAN'S SMOKE MASK

INDUSTRIAL SAFETY EQUIPMENT ASSOCIATION FOR SAFETY

ACME GAS MASKS

THESE PLUS ADVANTAGES ARE ADDED to the usual Acme Superiority:

1. New Canister (#084-FD-FWV)

- SEE-O Indicator Window—to tell how long it will protect against CO.
- High efficiency filter—to catch all visible smokes.
- Valve in the top—spring loaded to keep excessive humidity out of the top of the canister.

2. New Pouch (CM-346)

- Rugged canvas and webbing—to stand abrasion.
- Goes on easily—and stays on.
- Can be hung on a snap from the rig rail for donning on the run.
- Large "tape removal" opening at the bottom.
- Heavy zipper to close the facepiece in place.

3. Total weight only 6½ pounds

4. COSTS UNDER $50.00

Write for more information on ACME SUPERIOR FEATURES to the only Exclusive manufacturer of Full Facepiece Mask equipment

(How about naming the dealer you would like to do business with?)

ACME PROTECTION EQUIPMENT COMPANY

1215 Kalamazoo Street South Haven, Michigan

Holbrook Rescue Alarm

The Rescue Alarm Co., 84 State Street, Boston 9, Mass., is marketing an emergency signaling horn that firemen entering burning buildings may wear on their belts or mask straps. In the event of becoming injured, lost or trapped, the device may be triggered to signal for help. Said to weigh 2¼ pounds, it is self-contained and powered by Freon 22 gas. A sight glass permits quick visual check of the power supply. It is claimed the horn gives a loud, high-pitched blast which can be coded or continuous at the will of the operator.

The device was designed by Chief Donald Holbrook, Meadowood Fire Department, Fitzwilliam, N. H., in cooperation with the Falcon Alarm Co., Summit, N. J.

AllClass Extinguishers

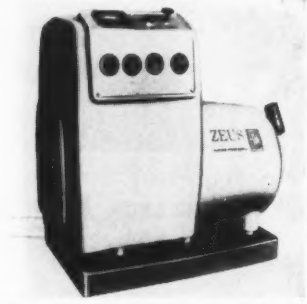
The Alim Corp., 11 Park Place, New York 7, N. Y., has introduced the ABC AllClass fire extinguisher which carries a UL rating of 1-A, 12-BC in the 15 pound size and 2-A, 20-BC rating in the 25-pound size. Both are said to be effective

on magnesium fires as well. The patented dry-chemical-type extinguishing agent employed is said to "incoolate" on contact with fire. This is explained as a chemical reaction whereby the discharged powder forms a cooling, insulating blanket which is deposited on burning Class A material and magnesium. Insulation is formed by the deposit and the change from powder to deposit utilizes and absorbs heat. A smothering and cooling effect is employed for Class B fires and the material is a nonconductor for Class C fires. The UL recommendations for magnesium fires is 4 pounds of the extinguishing agent per 1 pound of magnesium. A 5-pound model is also produced which carries a UL rating of 8-BC.

Truco-Denver Buys Ajax Iron Works

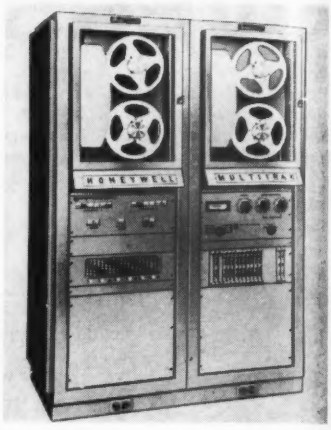
Truck Equipment Company, Denver, Colo., has purchased a major interest in the Ajax Iron Works, 1709 Blake Street, Denver. Ajax specializes in steel fabrication.

Zeus Portable Generator



The Western Branch, Pesco Products Division, Borg-Warner Corp., 3310 Vanowen Street, Burbank, Calif., has announced the new model GW-300 Zeus portable generator. Said to have an output of 3000 watts a.c., it features a permanent magnet alternator and recoil or electric start.

MultiTrak Voice Monitor



A new electronic system that records as many as 20 separate radio or telephone communications simultaneously on 1-inch-wide magnetic tape has been announced by Minneapolis-Honeywell Regulator Company. The transistorized system, known as the MultiTrak Voice Monitor, is designed to record all verbal data received and transmitted at central control facilities. An interlock is said to prevent accidental erasure of the recording.

Engine Speed Monitor

Knecht's Inc., 3400 Main Street, Springfield, Ore., has introduced the "Speed Monitor," a hydraulic coupling device which, it is claimed, converts any variable-speed rotating energy source to a constant speed without loss of power. It is said the fluid coupling may be used for controlling the speed of belt-driven automobile-engine accessories. For example, a maximum electrical output and cooling may be delivered from idle speed through full throttle.

Glendora Fire Department Adds High Fog Pump

The Glendora, Calif., Fire Department recently equipped one of its pumpers with a high-pressure pump built by High Fog Pump Co., 35 Santa Clara Street, Arcadia, Calif. The compact unit is said to produce up to 1,000 psi and weighs 200 pounds.

Continued on page 414

500-750-1000 GPM
HALE FIRE PUMP COMPANY
CONSHOHOCKEN, PA.

Announcing the New HALE Type QLD

For PERFORMANCE above and beyond the call of duty

Experienced Firefighters know that HALE Pumps perform "above and beyond the call of duty."

The New HALE QLD is outstanding for its ability to do just that. It is specifically designed to meet and amply exceed 500-750 and 1000 GPM Class A ratings.

If you need a Pumper in this class, the NEW "QLD" is just what you have been looking for.

It's the rugged younger brother of the big "Q"; includes the latest design features such as 2" drive shafts in the pump drive unit—so important for heavy duty service.

Write today for detailed information on the "QLD"—one of HALE'S FOUR Basic Pumps.

Specify HALE 'QLD'

500–750–1000 GPM

HALE FIRE PUMP COMPANY
CONSHOHOCKEN, PA.

at records
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page 414

FALSE ALARMS

Wrong Diagnosis

The president of the ladies auxiliary had recently completed a training course in first aid and, duly impressed, was looking for an opportunity to display her knowledge and skill. One Sunday while attending church, a man seated beside her suffered an apparent heart attack just as the collection was to be taken up. His head dipped slowly downward at an unprayerful moment.

Quickly seizing the initiative, and the unfortunate male, she pressed his head on his knees to restore blood circulation.

"Lady," croaked her victim, "let me up, please. I just dropped a dime."

A young bride walked into a drug store and approached a clerk timidly.

"The baby tonic you advertise—" she began—"does it really make bigger and stronger babies?"

"We sell a lot of it," replied the druggist, "and we've never had a complaint."

"Well, I'll take a bottle," said the bride after a moment, and went out.

In five minutes she was back. She got the druggist into a corner and whispered into his ear—

"I forgot to ask about this baby tonic," she said under her breath.

"Who takes it—me or my husband?"

A backwoodsman, admiring the wonders of a swank hotel lobby, was particularly intrigued by the elevators. He watched as a little old lady stepped into one and disappeared behind the sliding door. Seconds later, the elevator returned and out stepped a stunning redhead.

"Golly," he marveled. "I should have brought my wife after all."

A tourist spotted an Indian sending up smoke signals in the desert. He had a fire extinguisher strapped to his side.

"What's the idea of the fire extinguisher?" asked the tourist.

The rugged redskin replied, "If me misspellum word, me erasum."

Before leaving his office to go out to lunch, a fire chief, building a new house, sent his aide to find out when the interior decorating could be started. Returning from lunch he found a note on his desk reading: "On account of Joe and Fred was, your house ain't plastered yet . . . Sam."

The head of the family is the one who can spend $5 without having to explain it to the other.

Doctor: "You say that you can think of nothing but girls? My good man you'll just have to stop that or you'll lose your hearing."

Kinkchaser: "Is that so?"

Doctor: "What did you say?"

Kitty: "Honey, isn't this the most gorgeous mink coat you ever saw? I just got it last night. How do I look?"

Catty: "Guilty!"

Two drunks, wandering through the zoo, found themselves in front of a lion's cage. They stood watching the beast for a few minutes when suddenly the lion let out a roar.

"C'mon, let's go," said the first.

"Go ahead if you want to," said the other, "I'm gonna stay for the movie."

By the time a man gets old enough to watch his step, he isn't going anywhere.

The older generation thought nothing of getting up at 6 o'clock in the morning. The younger generation doesn't thing much of it either.

Editorial License

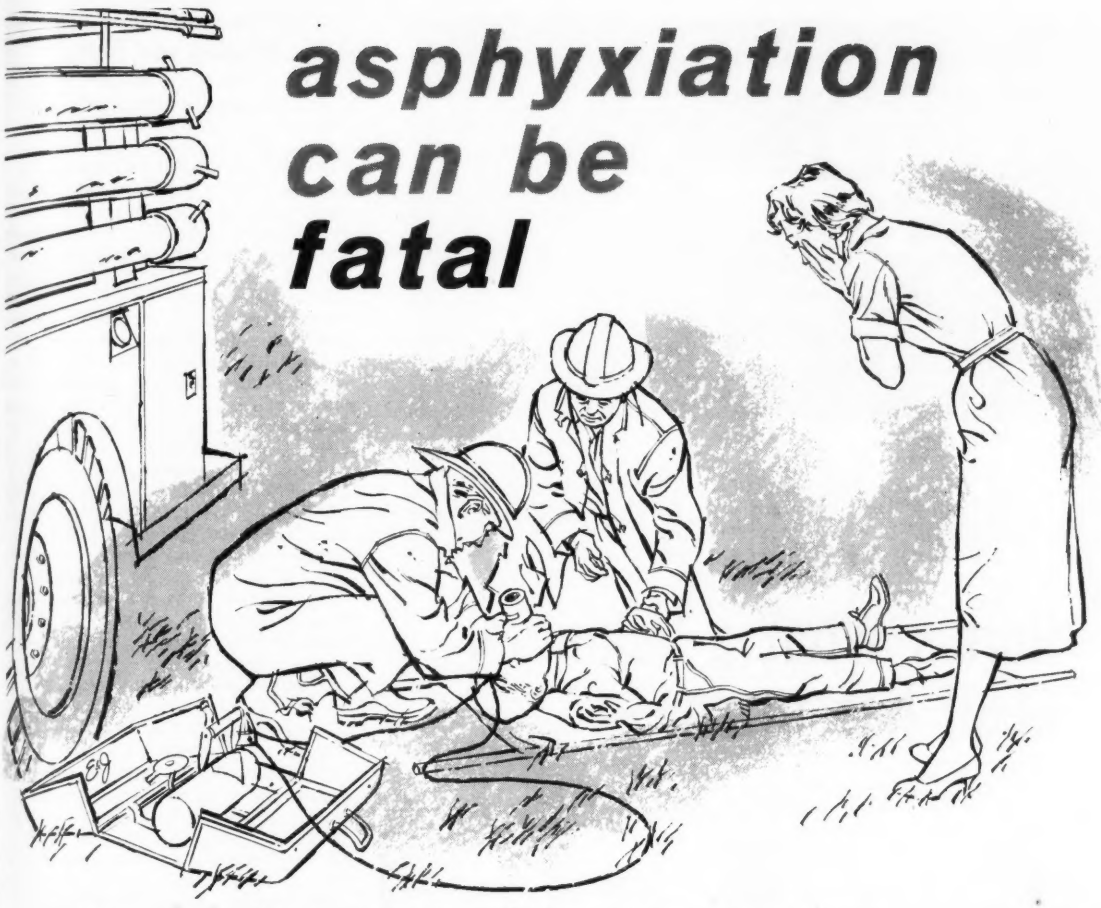
Two fire alarm electricians were repairing an overhead cable near the home of a very prim spinster. At one point the proper lady was shocked and very disturbed by the language she overheard the men using. Immediately she called the fire department and reproved the chief in no uncertain manner. The chief thereupon demanded a complete report of the incident from the alarm superintendent. The written explanation from the unfortunate culprits was as follows:

"Me and Joe Jones were on the job. I was up the pole and accidentally dropped my pliers on Joe's head. Joe looked up and said, "you really must be more careful, Harry."

According to a recent survey, the Government bureau which has the largest number of employees is the Internal Revenue Service. Last reports noted that almost 70 million people are working for it.

"Think we'd oughtta set the ground jacks under that?"

asphyxiation can be fatal

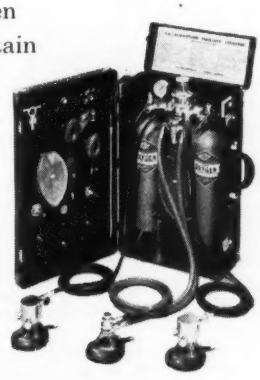


. . . unless rescue breathing is started immediately. A life may be saved even when breathing has stopped if mouth-to-mouth breathing is started to sustain life *until* the E & J® Resuscitator with life-saving oxygen arrives.

The E & J will get oxygen into the victim's lungs despite partial blockage, and breathes automatically for the patient until normal breathing can be restored.

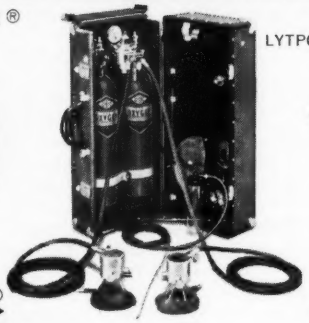
E&J . . . first name in resuscitators!

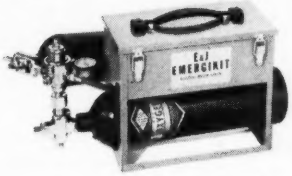
ICR MODEL



LYTPORT II ®

LYTPORT I





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We would like to demonstrate the versatility of these E & J lifesaving units—just mail the coupon or call your local safety equipment dealer.

Serving the Medical Profession for Over Fifty Years 1910-1960

OHIO®

Ohio Chemical

OHIO CHEMICAL & SURGICAL EQUIPMENT CO.

Madison 10, Wisconsin

Ohio Chemical Pacific Company, Berkeley 10, Calif. • Ohio Chemical Canada Limited, Toronto 2, Ontario • Airco Company International, New York 17, N.Y. Cia. Cubaña de Oxigeno, Havana

(All divisions or subsidiaries of Air Reduction Company, Incorporated) AIRCO

MAIL TODAY!

Ohio Chemical & Surgical Equipment Company, Dept. FE-5
1400 East Washington Avenue, Madison 10, Wisconsin

Check below:

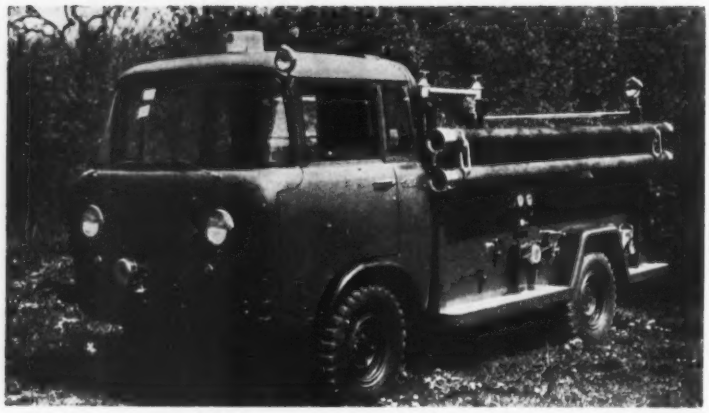
( ) Send descriptive folder on E & J equipment, Form No. 2460

( ) I would like a demonstration

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE____



103½" W.B. Heavy Duty Chassis with 8 Ply Tires—8000# G.V.W. Rating—105 H.P. Engine—Full Cab—500 G.P.M. Mid-Ship Pump Class "A"—200 Gal. Booster Tank and Reel—150'-1" hose—hose bed capacity 1000' of 2½"—Ladders, Axe and Pike Pole—Compartment 20" x 20" x 60"—Complete Fire Equipment as pictured—2 lengths of 4" suction hose—write for complete specifications and prices.

Here's What a Volunteer Chief has to say —

ROEBLING VOLUNTEER FIRE CO. No. 3
SEVENTH AND KNICKERBOCKER AVENUES
ROEBLING, NEW JERSEY

FLORENCE TOWNSHIP

Phone Florence 7-0594

January 8, 1960

For over a year we have owned a FC170 Jeep fire truck, manufactured by the Valley Fire Truck Co. We are especially proud of this apparatus. It has saved us considerable manhours and manpower. We have knocked down and put out many brush fires with little effort and only using the driver of the vehicle and a man handling the booster hose while the vehicle was in motion.

I wish to cite an instance when our truck was called out of our district to combat a field fire where at least 10 other companies were called for assistance. Being a windy day the fire raced across dry grass and cornfields uncontrolled. Manpower was utilized with indian tanks as this was the only means of getting to the fire. With the fire heading towards a farm dwelling and barn, our JEEP took thru the fields, knocked down the fire which was approaching the dwelling and barn and then proceeded to extinguish the rest of the field fire.

The versatility of this truck, makes it easy to operate and it can solve many pesky problems for an organized fire department.

ROEBLING VOLUNTEER FIRE CO. #3

Theodore Mitre

Theodore Mitre, Chief

A Fire Fighting Truck that will do everything that a large one can, and go places and fill the need that others CANNOT. Powered by the famous Super Hurricane, 6 cylinder, 105 H.P. engine. 6¼ ft. wide and 20 ft. long.
Off the road fire fighting, no other can follow the Willys Champion Fire Truck. You can pump with truck in motion.
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Among the Buffs

By Paul C. Ditzel

FIRE ENGINEERING Editor Don O'Brien wonders whether any fire fan can duplicate a recent experience he had in Memphis. An outbreak of fire across the street from the restaurant while he was eating his soup; a second alarm pulled during the serving of the entré; third and fourth alarms during dessert, and overhaul during after dinner coffee.

Don tells it this way:

"On Friday, March 4, following conclusion of the Memphis Fire Department Instructors Conference, I went to dinner at the Claridge Hotel with Deputy Chief and Mrs. Louis Vogt of Rochester, N. Y. We joined Emmett Cox, chairman of the FDIC and Joe (T. F.) Fetters, Illinois State Fire Training Chief."

The dining room, it seems, overlooks Main Street.

"Shortly after the first course," says Don, "we noticed a commotion across the street. It turned out to be a fire in a women's apparel store.

"Without moving from our table, we observed a complete, and rough, four-alarm fire from the sounding of the alarm through the overhaul.

"The water tower, an aerial, a lighting wagon, and a turret wagon were spotted right in front of us as we enjoyed the meal and watched the efficient Memphis firemen demonstrate the effectiveness of their training and pre-fire planning." (See April 1960 cover, FIRE ENGINEERING.)

More evidence of the new look in Chicago is the latest annual report. Without question, it is the most professional production ever to come from that department and certainly provides a model for other cities to study. Pictorially, and graphically, it should win top prize in any competition.

Chief Charles M. Johnson of the Chicago Civil Defense Fire and Rescue Service reports that the fire business is active and trading brisk. Of great interest is an extensive pictorial feature, "When a Fireman Needs a Friend," which appeared in the *Chicago American*. The article chronicled the dedicated service to Chicago that Chief Johnson and his brothers-in-arms are donating to the city.

"Equipment (and training) is the reason," says *Chicago American* writer Sam Blair, "for the outstanding success of the C.D. unit and for its acceptance by regular firemen as an auxiliary, without which it would now be difficult to handle large fires and major disasters.

"The crash of the giant cargo plane at Midway Airport late in 1959 presented one of the most recent occasions for the employment of most of the equipment on the trucks. There were three of them at the scene within minutes after the plane plowed into the homes adjacent to the airport.

"By coincidence, Leo A. Hoegh, National Director of Civil Defense, was in Chicago at the time. He was an intensely interested spectator as the Chicago unit

used the trucks' winches to pull down crumbling walls. . . . Hoegh had high praise for the work of Fire and Rescue Service."

What with Bob Quinn's accomplishments since becoming Chicago fire commissioner, Chief Johnson and his unit, and the city's two active fire fan organizations, the Chicago Fire Fans Association and the 5-11 Club, delegates to the 1961 National Convention of International Fire Buff Associates can look forward to an interesting time. Sixteen members, including seven members of the IFBA—representing 11 fan clubs in nine cities—met at the LaSalle Hotel in Chicago recently to plan the convention.

The IFBA delegates had opportunity to see a demonstration of two of Chicago's new 144-foot Magirus ladders. They also responded to a 2-11 alarm in a three-story building at 4524 Drexel Boulevard. Jim Kirkley of the CFFA guided the visitors around the department and they also saw Snorkel 2 in action. The itinerary also included visits to Chicago's newest stations—Engines 4 and 27—and the new Jeep pressure wagon. The lads at Truck 10 also showed off their 100-foot Magirus.

Over in New York, Veteran Buff Bill Herries of 316 West 47th Street, has received his honorable discharge as a member of the Civil Defense Fire Auxiliary Corps at 54 Engine. Bill has given many years of interest and devotion to the New York Fire Department and his unselfish service in civil defense was an example to all New Yorkers. Bill would be on duty yet had he not reached the age limit of 63. He's been a buff around 54 Engine for the past 33 years.

In Jackson, Mich., Buff Phillip B. Williams of 709 Crescent Road, would like to hear from buffs in his area or anywhere in Michigan. He is interested in all phases of fire fighting, prevention, and fire service literature.

In striking this out for another month, I must ask all buffs and club secretaries to immediately change their mailing addresses for this column. My harried postman tells me the casers at the post office are weary of forwarding mail from my P. O. box which I gave up many moons ago. The address is 4234 Don Diablo Drive, Los Angeles 8, Calif. □□

March Fire Losses

Estimated fire losses in the United States during March amounted to $116,385,000, the National Board of Fire Underwriters has reported.

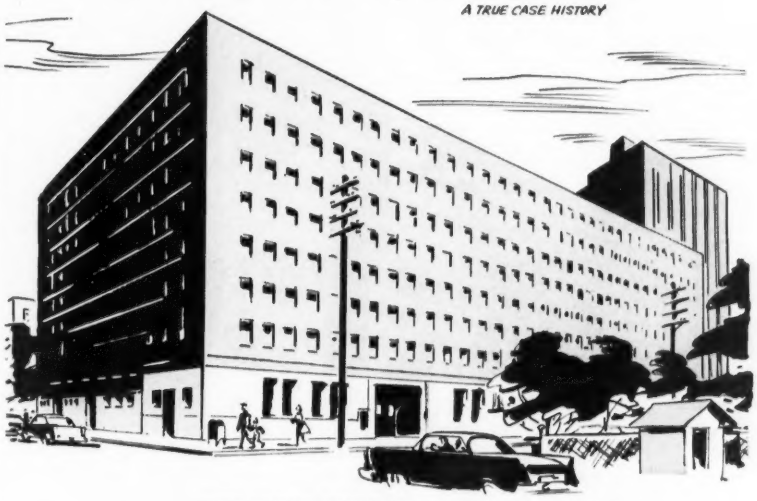
According to Lewis A. Vincent, NBFU's general manager, this $116,365,000 loss represents an increase of 16.8 per cent over losses of $99,610,000 reported for March 1959, and an increase of 20.2 per cent over losses of $96,782,000 for last February.

Losses for the first three months of 1960 now total $306,096,000, a decrease of 1.5 per cent from the first three months of 1959, when they amounted to $310,713,000.

These estimated losses include an allowance for uninsured and unreported losses.

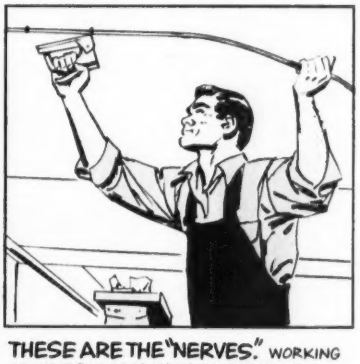
HOW would you SOLVE this FIRE problem?

A TRUE CASE HISTORY



THIS IS THE BUILDING. BIG, COSTLY...AND OLD. INSIDE, WOODEN STRUCTURE, WOODEN FLOORS. AND, TO COMPLICATE MATTERS, A FLAMMABLE PRODUCT IS MADE HERE—PAPER DISPLAYS AND STORAGE. PROBLEM: HOW TO INSURE FAST, DEPENDABLE DETECTION OF FIRE.

THIS IS THE MAN. CONCERNED THAT ORDINARY PROTECTION MIGHT NOT PROVE ADEQUATE IN AN EMERGENCY, THE BUILDING MANAGER CALLED IN HIS KIDDE REPRESENTATIVE. SMART MOVE, SINCE THIS WAS A JOB FOR AN EXPERT.



THESE ARE THE "NERVES." WORKING WITH THE BUILDING MANAGER, THE KIDDE MAN DIVIDED THE BUILDING INTO 28 FIRE "ZONES." NEXT, MORE THAN 40,000 FEET OF THIN COPPER TUBING WERE INSTALLED..."NERVES" OF A **KIDDE ATMO** FIRE DETECTING SYSTEM.

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MANUFACTURERS' NEWS

Continued from page 408

Appointments and Promotions

Edward R. Randall has been appointed manager, Installation & Service Department, Industrial and Marine Division, Walter Kidde & Company, Inc., Belleville, N. J. He was formerly director of purchases for the Industrial and Marine Division.

James A. Bowman has been promoted to advertising and sales promotion manager, Ansul Chemical Co., Marinette, Wis. He succeeds Brad Sebstad, who resigned to establish his own advertising agency.

Mrs. Gabrielle M. Hearst has been elected president of the Flamort Chemical Co., San Francisco, Calif. She succeeds Dr. Walter R. Hearst, founder of the company, who died on March 20. Mrs. Hearst has announced she will continue the management and established policies of the company.

Wallace P. Miller has been named manager, two-way radio sales, midwestern states, by Motorola Communications & Electronics, Inc. In his new capacity, he supervises mobile radio sales throughout a 13-state area extending from Ohio to North and South Dakota, with headquarters in Chicago.

John F. Fussell succeeds Miller as sales manager, New York State. He was formerly regional manager for Maryland, Virginia, North Carolina and South Carolina. His new office will be in Fair Lawn, N. J., at Motorola's eastern area sales and service headquarters.

R. G. (Pete) Ashbaugh has been named president of Elkhart Brass Manufacturing Company, Elkhart, Ind. E. H. Hansen, president since 1943, has advanced to board chairman.

A half-back on Notre Dame's championship football teams of 1946 and '47, Ashbaugh joined Elkhart in 1948 and in 1956 became executive vice president and general manager.

Ricardo H. Vergara has been appointed chief engineer of the Ward LaFrance Truck Corp. of Elmira, N. Y. He joined the company in February 1959 as a project engineer.

He will direct engineering activities for all Ward LaFrance divisions, as well as engineering research and development.

Jack L. Duke has been named Gulf Coast sales representative for Solar Aircraft Company gas turbine engines and turbomachinery products. His offices will be located in Houston, Tex.

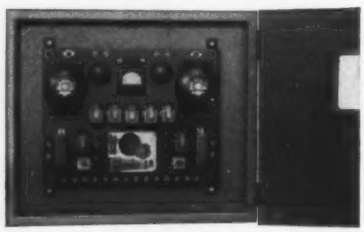
John C. Lambert has joined the sales staff of the Alim Corporation, New York, N. Y. He was formerly a regional sales manager for Leeder Mfg. Co.

R. J. Buchanan has been appointed manager, Special Hazards Department, "Automatic" Sprinkler Corporation of America, Youngstown, Ohio. He will di-

Many of today's otherwise modern schools are protected by inadequate fire alarm systems. They rely wholly on visual fire detection, require manual operation and provide no automatic means for calling the fire department. Often fires are well advanced before discovery.

Isn't it time we planned for maximum protection instead of simply meeting minimum state requirements? Isn't it time we stopped compromising the safety of our children to save a few dollars?

Autocall's Type SA School Alarm System far exceeds minimum requirements... offers advanced security features you won't find in any other system. A letter will bring you complete information. There's a nearby Autocall representative to explain the advantages.



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rect sales and development of fire protection and prevention systems for industrial, commercial and military applications and will headquarter at the company's home office.

Joseph Esher has been appointed executive vice president of the American La France Division, Elmira, N. Y., becoming second in command to Dan S. Ellis,

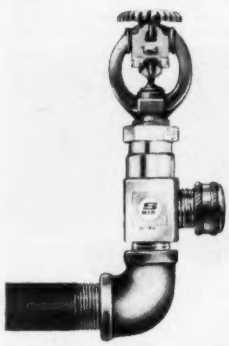
American La France president. Mr. Esher has been vice president and general manager of the ALF-Herman Corporation, St. Louis, Mo.

William Irish, presently general sales manager of the ALF-Herman Corporation, has been promoted to the new post of manager of operations.

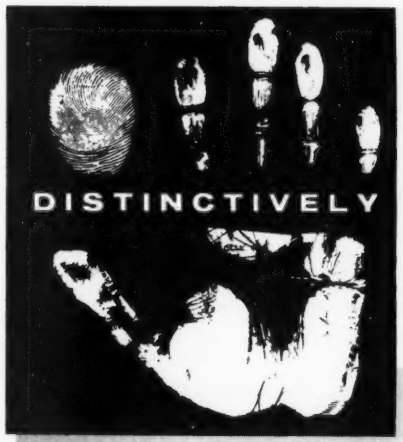
Redesigned Light Plants

Pacific Mercury, 13232 Leadwell, North Hollywood, Calif., has redesigned its 1750, 2000 and 2500-watt electric plants, which is said to reduce the weight of the generators by 25 pounds. An increase of horsepower from 10 to 15 per cent is claimed.

Sprinkler Flow Tester



Seco Mfg., Inc., 4461 West Jefferson, Detroit 9, Mich., has introduced a line tester for determining the condition of sprinkler branch lines. The side outlet cap is removed, a hose connected and the hex head turned to the open position to make a flow test for branch line obstructions. The permanently installed device is said to be approved by Factory Mutual Laboratories. □□



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Coming Events

May 26-28—California Fire Chiefs Association. Annual meeting, Santa Monica, Calif. For information write Chief C. N. Carrell, Fire Headquarters, Santa Monica.

June 2-4—Eastern Association of Fire Chiefs. Annual meeting, Ocean City, N. J. Secretary, Chief Edwin J. Clark, Box 328, Wayne, Pa.

June 2-4—Wyoming State Firemen's Association. Annual meeting, fire school and tournament, Newcastle, Wyo. Arrangements have been made with the Strategic Air Command at Ellsworth Air Base, S. D., for a six-hour fire school. For information, write Franklin B. Humes, Secretary-Treasurer, P. O. Box 71, Newcastle.

June 3-4—Indiana Volunteer Firemen's Association. Annual meeting, Clinton. Secretary, Harry Fries, Rural Route 3, Walkerton, Ind.

June 9-10—Southeastern Association of Fire Chiefs. Annual meeting, Jacksonville, Fla. Secretary-Treasurer, Chief C. W. Wyrick, Fire Headquarters, Greensboro, N. C.

June 9-11—Montana State Fire Chiefs Association. Annual meeting, Racetrack Volunteer Fire Department, Butte. Secretary, William S. Hayes, 208 Eklund Building, Great Falls.

June 10-11—Dauphin County Volunteer Fireman's Association. Annual meeting, Harrisburg, Pa. Sponsored by the Goodwill Fire Co. No. 7 and Reily Hose Co. No. 10. Secretary, D. Edgar Fox, 723 North 19th Street, Harrisburg, Pa.

June 10-11—Southwest Virginia Firemens Association. Annual meeting, Norton, Va. For information, write Lieutenant William H. Quarterman, Jr., Norton Fire Department, Box 141, Norton, Va.

June 14-16—State Firemen's and Fire Marshals' Association of Texas. Annual meeting, Galveston, Tex. Secretary, David Clabaugh, Carthage, Tex.

June 15-18—Colorado State Firemen's Association. Annual meeting, Colorado Springs, Colo. Secretary, Arthur J. Becker, 2224 South Stuart Street, Denver 19, Colo.

June 16-18—Hudson Valley Volunteer Firemen's Association. Annual meeting, Monticello, New York. Secretary, Charles M. Fales, 92 Clove Avenue, Haverstraw, N. Y.

June 19-21—South Carolina State Firemen's Association. Annual meeting, Poinsette Hotel, Greenville, S. C. Secretary-Treasurer, David H. Gillam, Jr., Orangeburg, S. C.

June 19-22—Campus Safety Association. Annual meeting, Cornell University, Ithaca, N. Y. For information, write Daniel P. Webster, Staff Representative, Higher Education Section, National Safety Council, 425 North Michigan Avenue, Chicago 11, Ill.

June 20-23—New England Association of Fire Chiefs. Annual meeting, Wentworth by the Sea, Portsmouth, N. H. Secretary-Treasurer, Chief Albert W. Kimball, 25 Leavitt Street, Hingham, Mass.

June 22-25—International Fire Buff Associates, Inc. Annual meeting, Chester, Pa. Secretary, Robert B. Wren, 3430 Saybrook Avenue, Cincinnati 8, Ohio.

June 23-25—Six County Firemen's Association. Annual meeting, festival and parade, Milton, Pa. Chairman, Owen C. Ranck, 112 Broadway, Milton, Pa.

June 27-29—Missouri Valley Association of Fire Chiefs. Annual meeting, Des Moines, Iowa. Secretary-Treasurer, Chief Paul A. Soener, Independence, Iowa.

July 2-3—Oklahoma State University School of Fire Protection reunion, Stillwater, Okla. For information contact, Assistant Chief W. C. Buck, Campus Fire Station, Stillwater.

July 4—Freeport Fire Department annual parade, firemanic show and fireworks, Municipal Stadium, Freeport, L. I., N. Y. For information, write Harry A. O'Rourke, Secretary, 47 Rutland Road, Freeport, N. Y.

Aug. 19-21—Connecticut State Firemen's Association. Annual convention and parade, New London, Conn. For information write the New London Firemen's Association, Convention Committee, Inc., P. O. Box 811, New London, Conn.

Aug. 25-27—Westchester County Volunteer Firemen's Association. Annual meeting, Ossining, N. Y. For information contact William Johnson, Co-Chairman, Box 334, Ossining, N. Y.

July 11-12—Michigan State Fire Chiefs Association. Saginaw, Mich. Secretary, Chief Edward F. Klecka, Jr., 1102 Ruddiman Avenue, North Muskegon, Mich.

Aug. 28-30—New York State Permanent Firemen's Association. Annual meeting, Tonawanda, N. Y. Secretary-Treasurer, Robert E. Mills, 420 Plymouth Drive, Syracuse 6, N. Y.

Aug. 28-Sept. 3—International Association of Fire Fighters. Annual meeting, Buffalo, N. Y. Secretary-Treasurer, John C. Kabachus, AFL-CIO Building, 815 Sixteenth Street, N. W., Washington 6, D. C.

Sept. 12-15—International Association of Fire Chiefs. Annual meeting, Hotel Manger Seneca, Rochester, N. Y. Secretary-Manager, B. Richter Townsend, 232 Madison Avenue, New York 16, N. Y.

September 15—Delaware Fire Chiefs Association. Semiannual meeting, Bridgeville, Dela. Secretary, Howell H. Barnes, Smyrna, Dela.

Sept. 16-17—Delaware Volunteer Firemen's As-

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sociation. Annual meeting, Bridgeville, Dela. Secretary, E. Reynolds Bradley, Smyrna, Dela.

Sept. 19-22 — Canadian Association of Fire Chiefs. Annual meeting, Calgary, Alberta. Secretary-Treasurer, Chief Allan H. Clark, Fire Headquarters, Lakefield, Ont.

Sept. 19-22—International Municipal Signal Association. Annual meeting, New York, N. Y. Secretary, Irvin Shulsinger, 130 West 42nd Street, New York 36, N. Y.

Sept. 20-21—Iowa Firemen's Association. Annual meeting, Guthrie Center, Ia. Secretary, A. B. Arnold, c/o Fire Department, Mason City, Iowa.

Sept. 25-28—Pacific Coast Inter-Mountain Association of Fire Chiefs. Annual meeting, Las Vegas, Nev. Secretary-Treasurer, S. E. Edmundson, 1248 Marengo St., Pasadena, Calif.

Oct. 17-21—National Safety Congress. Annual meeting, Chicago, Ill. Further information may be obtained from R. L. Forney, secretary, National Safety Council, 425 North Michigan Avenue, Chicago 11, Ill.

Oct. 31-Nov. 2—Illinois Firemen's Association. Annual meeting, Springfield, Ill. Secretary, R. W. Alsip, Box 8, Champaign, Ill.

Nov. 3-5—International Rescue and First Aid Association. Annual meeting, Benjamin Franklin Hotel, Philadelphia, Pa. For further information, contact the Executive Office, 314 King Street, Alexandria, Va. □□

FIRE COLLEGES

Arizona State Fire School—Oct. 20-22, Phoenix, Ariz. For information write Chief Jake Siken, Supervisor of Training, Phoenix Fire Department.

Civil Defense Instructor Training Course for Eastern Area—June 13-17, June 20-24; June 27-July 1, **Basic Civil Defense for Instructors; Principles of Organization and Staffing;** May 23-27, June 6-10, June 13-17, June 20-24, **Radiological Monitoring for Instructors;** June 6-10, **Rescue Operations for Instructors.** All sessions will be held at the Eastern Instructor Training Center, Office of Civil Defense Mobilization, Brooklyn 35, N. Y. For information contact the Center at the above address.

Colorado State Fire School—June 15-18, Colorado Springs, Colo. For further information write Arthur J. Becker, Secretary, Colorado State Firemen's Association, 2224 South Stuart Street, Denver 19, Colo.

Connecticut State Fire College—June 6-10; Field Day, June 11, New Haven Fire Department Training Ground. For information write Roy W. Adams, Director, Vocational Training Field Service, Connecticut State Department of Education, 490 Capitol Avenue, Hartford, Conn.

Delaware Volunteer Firemen's Fire School—May 7-8, May 14-15, Camden-Wyoming, Dela. Chairman Granville T. White, Laurel.

Florida State Fire College—June 6-10, **Fire Pump Maintenance;** Aug. 8-12, **Seminar in Arson Investigation and Detection.** Sept. 5-9, **Units 101,** Tools, Forcible Entry, Breathing Apparatus, Extinguishers; **106,** Fire Inspection; **201,** Instructor Training, Sept. 12-16, **Units 102,** Hose and Ladders; **202,** Company Officer Training; **206,** Fire Prevention and Protection. Sept. 19-23, **Units 103,** Rescue, Ventilation, Salvage and Overhaul; **105,** Fire Apparatus and Pumps; **204,** Fire Fighting Tactics, Sept. 26-30, **Units 104,** Fire Streams; **107,** Arson Detection; **208,** Fire Department Administration. For information contact Florida State Fire College, P. O. Box 785, Ocala, Fla.

Illinois Fire College—June 13-16, University of Illinois Campus, Urbana, Ill. For information,

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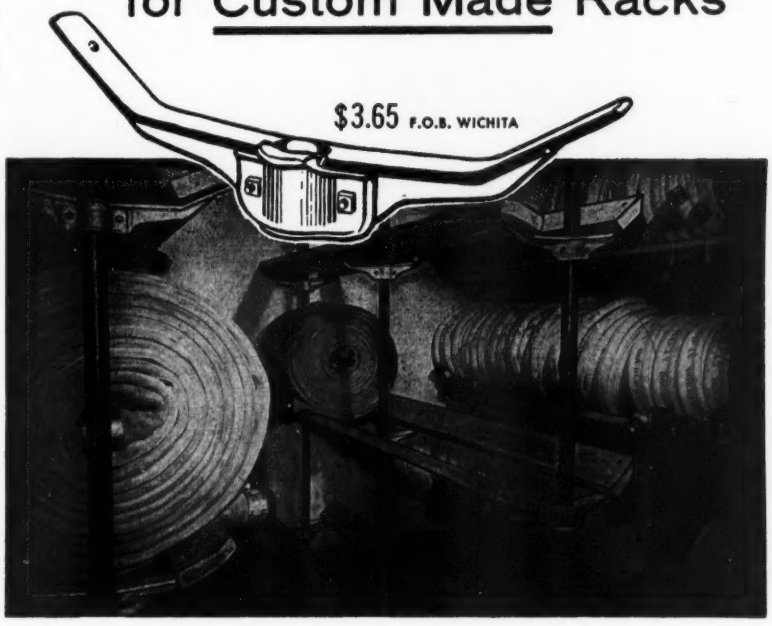

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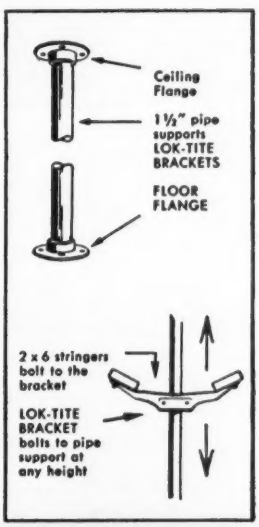
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write R. K. Newton, Director, Illinois Fire College, 725 South Wright Street, Champaign.

Indiana Fire Training Program—May 24-25, Rescue Training Course; Sept. 14-17, Annual Indiana State Fire School; Oct. 25-27, Fire Inspectors Course. All courses will be held at Purdue University, Lafayette. For information, write Professor Shelby Gallien, Director, Public Safety Institute, Purdue University, Lafayette, Ind.

Iowa Fire School—June 14-17, Iowa State College, Ames, Iowa.

Kentucky Fire School—June 6-8, Annual Fire School. Both sessions will be held at the University of Kentucky, Lexington, Ky. For information, write J. L. Thompson, Chairman, Fire School Committee, 940 Starks Building, Louisville 2, Ky.

Maryland Fire Service Training Program—**Pump School Series:** June 4-5, Hale Pumps; June 11-12, Seagrave Pumps. Aug. 1-3, **Aerial Ladder Short Course.** Aug. 9-10, **Governor's Conference on Fire Prevention;** Sept. 6-9, **Short Course for Firemen.** All courses to be held at Fire Service Extension Building, University of Maryland. For information, write, Robert C. Byrus, Director, P. O. Box 85, College Park, Md.

Monroe County Fire School—Sept. 17-18, Coolbaugh Township, Tobyhanna, Pa. For information contact James H. Oakey, Driector, Box 67, Tobyhanna, Pa.

Morris County Fire School—June 7, Long Hill Fire Co., Chatham Township; July 5, Norristown Fire Headquarters; Aug. 2, Whippany Fire Headquarters; Sept. 6, Budd Lake Fire Headquarters. For information, write Robert H. Wright, Publicity Chairman, Long Hill Lane, Chatham, N. J.

New Mexico Fire Marshal's Fire Protection Conference—June 6-8, Eastern New Mexico University, Portales. For details, contact John B. Woodall, Deputy State Fire Marshal, P. O. Box 311, Santa Fe.

Ohio State Fire School—Sept. 12-16, the Ohio State University, Columbus, Ohio. For information write The Trade and Industrial Education Services, 118 Townshend Hall, The Ohio State University, Columbus 10.

Ontario Fire College—May 23-27, **Radiological Monitoring Course;** May 30-June 3, **Temiskaming District Fire Course;** June 6-24, **Administration Course for Senior Officers;** June 13-17, **Oxford County Regional Fire School,** Woodstock; June 20-24, **Wellington County Regional Fire School;** July 11-15, **Basic Fire Inspection Practices Course;** July 18-22, **Sudbury District Regional Fire School,** Sudbury; July 25-29, **Pump Course;** Aug. 8-12, **Fire Department Instructors Course, Part I;** Aug. 15-26, **Fire Department Instructors' Course, Part II,** Aug. 9-Sept. 2, **Volunteer Fire Officers Course, Part I;** Sept. 12-16, **Eastern Ontario District Fire Course;** Sept. 19-23, **Pump Course;** Sept. 26-Oct. 7, **Company Officers' Course;** Oct. 17-21, **Basic Fire Inspection Practices Course;** Oct. 24-28, **Mutual Fire Aid Forum—County Fire Coordinators.** All courses will be held at the Ontario Fire College at Gravenhurst, Ont. For information, write W. J. Scott, Q.C., Fire Marshal, Province of Ontario, 210 Huron Street, Toronto 5.

Northwest Fire and Arson Investigation Seminar—May 23-27, Portland State College Auditorium, Portland, Ore. For information, write Cecil L. Dill, Fire Training Coordinator, Department of Education, Division of Vocational Education, 108 State Library Building, Salem, Ore., or Milton K. Davis, Portland Extension Center, P. O. Box 1491, Portland 7, Ore.

Pennsylvania State Firemen's Training School—May 23-27, **Advanced Fire Fighting;** June 6-10, **Fire Department Pump School;** June 20-24, **Basic Fire Fighting;** June 27-July 1, **Ladders, Rescue, Salvage;** July 11-15, **Advanced Fire Fighting;** July 25-29, **Fire Department Pump School;** Aug. 1-5, **Basic Fire Fighting;** Aug. 15-19, 22nd Annual Pennsylvania State Fire School; Aug. 20, **Instructors Conference;** Aug. 22-26, **Ladders, Rescue, Salvage;** Aug. 29-Sept. 2, **Advanced Fire Fighting;** Sept. 12-16, **Fire Department Pump**

School; Sept. 26-30, Basic Fire Fighting; Oct. 3-7, Advanced Fire Fighting; Oct. 17-21, Basic Fire Fighting; Oct. 31-Nov.4, Advanced Fire Fighting; Nov. 14-18, Fire Department Pump School. All courses to be held at the State Training School, Lewistown, Pa. For information contact Art Espey, Director, Box 631, Lewistown.

South Boston, Va., Fire School—Aug. 22-26. For information, write R. Lawrence Oliver, Director of School, State Department of Education, P. O. Box 654, Harrisonburg, Va.

Southern Wisconsin and Northern Illinois Fire School—Sept. 18. For further information, write Herman Pfund, Secretary, Southern Wisconsin and Northern Illinois Firemen's Association, New Glarus, Wis.

Tri-State Fire School—Aug. 22-26, **Fire School;** Nov. 15-18, **Instructors School for Company Officers,** Huntington, West Va. For information, write R. M. Myers, Secretary-Treasurer, Tri-State Fire School Association, 816 Ninth Street, Huntington.

Williamsburg Fire College—June 20-24, College of William and Mary, Williamsburg, Va. Director, Chief Elliott W. Jayne, Fire Headquarters, Williamsburg.

Wisconsin Fire Training Program—June 5, Regional Fire School, to be held in Kimberly; June 12, Regional Fire School to be held in Cameron; June 26, Regional Fire School to be held in Mellen. For information, contact William E. Clark, Supervisor, Fire Service Training, State Board of Vocational and Adult Education, 14 North Carroll Street, Madison 3, Wis. □□

New Haven Field Day

Demonstrations of advanced fire fighting equipment are being lined up for the field day Saturday, June 11, that will climax the Connecticut State Fire College week. The event will start at 9:30 a.m. at the New Haven Fire Department training ground, adjacent to exit 48 on the Connecticut Turnpike. Chief Thomas J. Collins of New Haven is in charge.

Special demonstrations include a portable foam tower and other methods of handling flammable liquid fires. A new ABC dry powder extinguisher will be displayed in action, with an Underwriters' Class A crib as a test. In a demonstration of fire-retardant paint, two 8-foot-square panels of acoustic tile, one painted and the other unpainted, will show flame action.

On Friday night, June 10, there will be an informal exhibition of fire fighting equipment at the training ground.

The Connecticut State Fire College starts Monday, June 6, for five days. The crash fire fighting course offered for the first time last year, again will be a feature. The students in this course will spend four days in New Haven and one day at Bradley Field, Windsor Locks, Conn.

R. P. Sylvia

Oklahoma A & M Reunion

Old "grads" and students of the Oklahoma State University School of Fire Protection, as well as members of the Stillwater Fire Department will hold a reunion in Stillwater on July 2 and 3. For information, contact Assistant Chief W. C. Buck, Campus Fire Station, Stillwater, Okla.

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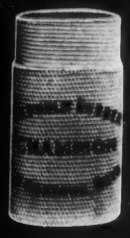

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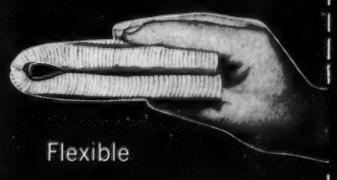

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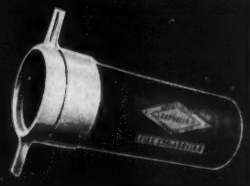

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What's Burning

THE FOLLOWING LIST includes fires of $10,000 and over in the United States and Canada for the period from March 20th to April 20th.

Scottsboro, Ala.—Sanctuary of Grace Baptist Church destroyed.
Anchorage, Alaska — Moosehorn Garage destroyed.
Phoenix, Ariz.—Sky Blue Trailer Court shed destroyed; adjacent Cut Rate Lumber Co. damaged.
Camden, Ark.—Whitefield Church of Christ destroyed.
Helena, Ark.—Moby Sawmill near Helena Crossing damaged.
Mansfield, Ark.—Dart Motor Co. destroyed; adjacent building damaged.
Pine Bluff, Ark.—Pure Oil Co. gasoline bulk plant, adjacent Planters Fertilizer & Soybean Co. and three dwellings destroyed.
Los Angeles, Calif.—Columbia Electronic Sales Co. damaged.
Oakland, Calif.—Dwelling of Chester E. Larson, Maynard Kimmey and seven others, damaged. Sparks from barbecue pit.
San Francisco, Calif.—Duplex dwelling at 11 Lexington Street extensively damaged.
San Jose, Calif.—Lucky Supermarket destroyed. Short circuit in freezer.
Denver, Colo.—Bank Block Building, housing Feldman Cap Co. damaged.
Danbury, Conn. — Seven buildings, housing Panel Corp. of America, Danbury Block and Supply Co. and West Fabrication Laboratories, Inc., destroyed.
Greenwich, Conn.—Conde-Nast Magazine Publishing Co. damaged.
North Haven, Conn.—North Haven Tire Supply Co. badly damaged.
Rockville, Conn.—Professional Building, housing restaurant, store, medical, dental, county and state offices, damaged.
Torrington, Conn. — Colonia Shop extensively damaged.
Dover, Del.—Delaware Poultry Farms destroyed. Faulty oil burner.
Greenwood, Fla.—C. L. Watford's Supermarket destroyed.
Hialeah, Fla.—Sunland Supply Co. destroyed.
Miami, Fla.—Flamingo Textile Co. destroyed.
Tallahassee, Fla.—Florida Theater virtually destroyed; adjoining F. W. Woolworth Store slightly damaged.
Vero Beach, Fla.—Gifford School For Negroes considerably damaged. Boy with matches.
Albany, Ga.—Southern Paper Co. warehouse destroyed.
Albany, Ga.—Negro apartment dwelling damaged.
Macon, Ga.—Quality Textile Co. and Goss Barber and Beauty Shop, next door, destroyed.
Savannah, Ga.—Southland Oil Corp. storage facilities damaged.
Belleville, Ill.—Henry Raab Elementary School damaged.
Clinton, Ill.—Barn housing pigs and equipment on Canfield Farm of Paul Wert, destroyed.
Golconda, Ill.—J. H. Walker Lumber Co. destroyed.
Half Day, Ill.—Block-long shopping center damaged.
Herrin, Ill.—Olin Mathieson Chemical Corp. dynamite plant destroyed.
Old Shawneetown, Ill.—Historic "Old Mansion" dwelling of former Mayor Paul Stefko considerably damaged.
Peoria, Ill.—Friendship Baptist Church badly damaged.
Xenia, Ill.—Xenia Grade School damaged.
Dunkirk, Ind.—Indiana Glass Co. warehouse destroyed.
Fort Wayne, Ind.—Marsh Foodliner's Speedway Supermarket damaged.
Ligonier, Ind.—All Metal Products Co. destroyed. Overheated tar tank.
Nora, Ind.—North Side Lumber and Hardware Inc. damaged.
Syracuse, Ind. — Syracuse Fire Department building destroyed.
Des Moines, Ia.—Town and Country Food Market damaged. Defective wiring.
Salina, Kans.—Grain Belt Supply Co. destroyed.
Topeka, Kans.—Business building destroyed; adjoining structures damaged.
Georgetown, Ky.—Two barns and two garages destroyed; another garage and dwelling damaged.
Louisville, Ky.—Bell Furniture Co. damaged.
Louisville, Ky.—Falls City Limb and Brace Co. damaged.
Martin, Ky.—Martin Restaurant and adjacent building, housing Beaver Auto Parts, barber shop and insurance office destroyed; adjacent building, housing Grazier Restaurant and novelty shop-newsstand damaged.
Shelbyville, Ky.—Roll Forming Sheet Metal Works damaged. Paint shop explosion.
New Orleans, La.—F. P. Richard Negro Elementary School damaged.
Baltimore, Md.—Farm building housing 1,300 baby turkeys on Louis A. Schramm farm, destroyed.
Baltimore, Md.—Five dwellings, 2805 to 2813 East Chase Street, destroyed; three others damaged. Leaking gas pipe.
Hagerstown, Md.—Warehouse housing Brandt Cabinet Works heavily damaged.
Hancock, Md.—Woodmont Rod and Gun Club buildings destroyed. Forest fire.
Princess Anne, Md.—Dairy barn and equipment on O. J. Smith farm destroyed.
West Lanham Hills, Md.—West Lanham Hills Elementary School damaged.
Burlington, Mass.—Shopping center, housing Sheker Glen Ceramic Shop, Winnmere Fabric Shop, Town Grocery Store, Donut Frame Shop, Kress 5 & 10¢ Store, fruit store and shoe repair shop, damaged.
Clinton, Mass.—Paint shop of Frank F. Witkowski, Sr., destroyed; adjacent dwelling damaged.
Housatonic, Mass.—Lennon Block and Central Block, housing Post Office damaged.
Lawrence, Mass.—Desmond Block, housing barber shop, insurance office, shoe and millinery stores and apartments, destroyed; two adjoin-

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ing apartment dwellings damaged. Possible arson.

Lawrence, Mass.—Merrimack Lumber Co. storage shed considerably damaged. Overheated door switch.

Lowell, Mass.—Ofgant Auto Sales and garage building destroyed.

Lynn, Mass.—Apartment dwelling and Mel and Murray's Delicatessen damaged.

Lynn, Mass.—Memorial Park Supermarket heavily damaged.

Shrewsbury, Mass.—Billings Marine, Inc. boating showroom damaged.

Battle Creek, Mich.—Wakely Building, housing Thom McAn Shoe Store and Men's Shop, Inc., destroyed.

Leonidas, Mich.—Five-Point Store, ice cream parlor and Milo Kellogg's barber shop destroyed.

Marshall, Mich.—Siesta Motel destroyed.

Sandusky, Mich.—Mavis Furniture Co. destroyed.

Sault Ste. Marie, Mich.—Main building of Welch's Boat Tours at Soo Locks on St. Mary's River destroyed.

Great Falls, Mont.—St. Joseph's Parsonage extensively damaged.

Concord, N. H.—Business-apartment building damaged.

Atlantic City, N. J.—Unoccupied Wiltshire Hotel, presently under alterations, destroyed; adjacent Governor Hotel and Surfside Hotel, one block away, damaged.

Camden, N. J.—Camden Catholic High School's annex building destroyed; main classroom building badly damaged.

Camden, N. J.—Walter's Auto Body Shop destroyed. Spray gun exploded.

Clementon, N. J.—Storage building and garage of Alpha Mfg. Co. heavily damaged.

Irvington, N. J.—Calavo Grower of California, Inc., fruit warehouse, destroyed.

Newark, N. J.—Household Fuel Trestles Inc., yard, Public School No. 9, shops, factories and at least 25 dwellings, damaged.

Westville, N. J.—Eagle Point Works of Texas Co. damaged. Explosion.

Wildwood, N. J.—Biltmore Hotel and Surf Club destroyed.

Wildwood, N. J.—Wildwood Recreation Center destroyed.

Buffalo, N. Y.—Medical Foundation of Buffalo and Buffalo Hearing and Speech Center building damaged.

Hempstead, L. I., N. Y.—Main Street shopping area, housing employment agency, pet shop, music shop and shoe store, damaged.

Henrietta, N. Y.—Genesee Valley Regional Market produce shed destroyed.

Homer, N. Y.—Garage owned by Durkee's Domestic Bakery destroyed. Short circuit in car.

Horseheads, N. Y.—Business block, housing Farm Implement Center, Beauty Shoppe, Village Dry Cleaners and Chemung Paint and Body Works, destroyed; tailor shop and shoe store damaged.

Oceanside, L. I., N. Y.—Grotto Chapel of St. Anthony's Parish virtually destroyed.

Albemarle, N. C.—Miller Wholesale Produce Co. destroyed.

High Point, N. C.—Emma Blair Elementary School heavily damaged.

Jonesville, N. C.—Winston Road Grocery Store, grocery-service station, destroyed; garage and apartment damaged.

New Bern, N. C.—Commodore Shipbuilding Plant destroyed.

Pekin, N. C.—Store-service station of Sam Blake destroyed.

Waynesville, N. C.—Giles Chemical Corp. damaged.

Wilmington, N. C.—Carolina Mills badly damaged.

Cincinnati, Ohio—Covenant First Presbyterian Church damaged.

Cincinnati, Ohio—Superior Laundry and Towel Supply Co. damaged.

Cincinnati, Ohio—Warehouse and manufacturing building at Matheson, Coleman and Bell Division of Matheson Co., Inc., destroyed.

Cincinnati, Ohio—U. S. Drill Head Co. damaged.

Weatherford, Okla.—Weatherford High School building considerably damaged.

Medford, Ore.—Rogue Valley Beverage Co. destroyed.

Medford, Ore.—Fabers Feed and Supply Co. destroyed.

Please turn page

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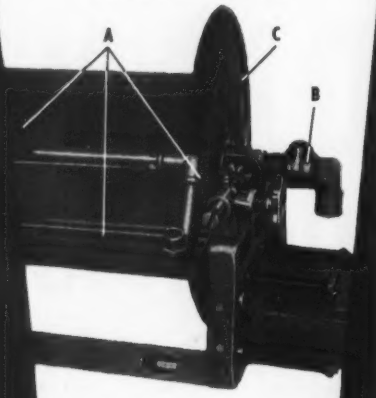

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Freedom, Pa.—Valvoline Div. of Ashland Oil Co. damaged.
Philadelphia, Pa.—Black & Brown, Inc., warehouse destroyed.
Philadelphia, Pa.—Container Corp. of America warehouse heavily damaged.
Philadelphia, Pa.—Cooper Overall Service badly damaged. Oil burner explosion.
Philadelphia, Pa.—Leslie Corp. of New York City warehouse destroyed. Explosion.
Philadelphia, Pa.—Row of 24 garages in Fernwood damaged.
Steelton, Pa.—Local 1688, United Steelworkers of America headquarters, destroyed.
Susquehanna, Pa.—Town Theater destroyed; Methodist Church, Todd Jewelry Store, Acme Grocery and Provision Market, and Lorraine Hotel, damaged. Defective wiring.
Yeadon, Pa.—Philadelphia & Suburban Tire Service heavily damaged.
York, Pa.—Star Laundry and Dry Cleaning Co. destroyed.
Norwich, R. I.—Durable Outlet Co. discount house damaged.
Pawtucket, R. I.—Public Furniture Co. and adjacent bakery and restaurant, damaged.
Providence, R. I.—D. F. Farrell & Sons barrel reconditioning firm badly damaged.
Providence, R. I.—R. I. Blind Co. considerably damaged.
Allendale, S. C.—Ti-Ti Peat Humus Co. plant destroyed.
Dillon, S. C.—Planing mill of D. O. Briggs Lumber Mill destroyed.
Mannings, S. C.—Foster Hardware Store building, Brown's Variety and Western Auto Store, badly damaged.
Union, S. C.—Santuc Elementary School destroyed. Defective flue.
Memphis, Tenn.—Russwood Park of Southern Baseball Association's Memphis Chicks and limb and brace shop of Donald Lee destroyed; Baptist and John Gaston City Hospitals, Radio Station WHHM, several buildings and stores, damaged.
Memphis, Tenn.—One Barret Chapel School building destroyed; another damaged.
Houston, Tex.—Printing shop building at University of Houston damaged.
Irving, Tex.—Amphibious Boat Co. damaged. Explosion.
Wichita Falls, Tex.—Paint shop near White Auto Stores, Inc., warehouse damaged. Arc from exhaust fan motor ignited paint fumes.
Blacksburg, Va.—J. B. Dowdy Restaurant destroyed.
Clifton Forge, Va.—C. A. Smith's funeral parlor, pool room, barber shop, restaurant and apartments in three buildings, damaged.
Clover, Va.—Three airplanes and hangar at Clover Airport destroyed.
Bellingham, Wash.—Grace Line Steamship Co. destroyed.
Olympia, Wash.—First Methodist Church damaged. Arson.
Snoqualmie, Wash. — Snoqualmie Apartment Building destroyed.
Tacoma, Wash.—Pacific Pattern Works and Johnson Engineering Co. destroyed.
Tacoma, Wash.—Western Plastics Plant destroyed.
Huntington, W. Va.—Building housing Rogers Jewelry and Household Finance Co. destroyed; Bailey's Cafeteria, Wender's Dress Shop, Davidson's Record Store and greeting card shop, damaged.
Milwaukee, Wis.—Apartment building damaged. Fire caused by cigarette.
Milwaukee, Wis.—Lodgewood Apartments damaged.
Milwaukee, Wis.—Three dwellings damaged. Paint fumes exploded.
Milwaukee, Wis.—Midwest Plumbing Supply Co. gutted by fire. □□

Correction

The March 1960 issue reported the Ketchikan, Alaska, Cold Storage and five business blocks destroyed by fire. Chief R. M. Bartholomew, Ketchikan Volunteer Fire Department, has informed FIRE ENGINEERING that the correct statement should be "10 per cent of the Ketchikan Cold Storage and five old, 25-foot, false-front 2½-story buildings destroyed."

Persons in the News

Fried Chief of Hinsdale, Ill.

Emanuel Fried assumed the duties of chief of the Hinsdale, Ill., Fire Department on May 9. He was formerly president of Gardwell Co., New Jersey fire consultants, and chief instructor to the Mount Vernon, N. Y., Fire Training Conference sponsored by the Mount Vernon Board of Education.

A veteran of 22 years service with the New York Fire Department, Chief Fried retired in 1958, with the rank of deputy chief. He was appointed to the department in May 1936; was promoted to lieutenant in July 1942; captain, July 1949; battalion chief, January 1954; and deputy chief, February 1958.

He was awarded the Department Medal of Honor and Franklin Delano Roosevelt Medal in June 1947, for "meritorious service at extreme personal risk" for rescuing a woman at a building collapse and fire in December 1946.

Heads New York Fire Patrol

Henry S. McKinney, veteran salvageman of the New York Fire Patrol, has been appointed chief, succeeding to the position left vacant by the recent resignation of Chief Joseph Scanlon. He joined the fire patrol in 1927 and was appointed deputy chief in 1954. In recent years he has been in charge of the patrol training school. □□

New Fire Fighting Film

A new 20-minute, 16-mm color training film "Fire Fighting in Country Elevators" has been released by Firemanship Training, Engineering Extension, Iowa State University. The educational film stresses pre-fire planning and the importance of outside access, alarm systems and sprinkler systems. The purchase price is $150 including reel and can. For further information contact Keith Royer, supervisor, 110 Marston Hall, Ames, Iowa.

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the round table

discussion of current fire department and fire management problems

Handling Manpower Shortages

THIS IS THE SECOND installment of the Round Table on handling manpower shortages.

Readers are invited to participate in the discussion which will be concluded in the June issue. Address replies to Round Table Editor, FIRE ENGINEERING, 466 Lexington Avenue, New York 17, N. Y.

The Discussion

Harris Hancock, Chief, Lawton, Okla.: Two full companies are used as swing shifts to maintain department strength when men take their time off.

College students are used in the summer while men take their vacations.

No provisions are made when men are ill. Companies must run low.

During illness, injury or vacation periods of officers, other officers are redistributed and first-class firemen substitute for the latter.

Our department regulations do not require that normally off-duty personnel work extra time in the event of serious manpower depletion by illness or injury.

Sidney F. Morse, Chief, Billings, Mont.: This department has for the past few years set up a budget to pay for extra shifts worked by members of the department to fill in for sickness, vacations, etc. A roster is maintained so that all members who wish to work are given equal numbers of extra shifts. These shifts are accumulated and are paid in December and just before the end of the fiscal year in June.

We find that this gives our members a chance to earn extra money and we are able to get better coverage by hiring and placing the men as we need them to fill in. Last year nearly 600 extra shifts were worked in this manner and we were able to keep our companies at the required strength at all times.

Frank S. Sandeman, Chief, Long Beach, Calif.: General manpower levels average three men for each two on duty. This does not include military leave, sick leave, injury leave, holiday time, etc., but does include regular shifts off.

Transfers are arranged in our department to take care of the temporarily vacant positions due to illness.

No provisions are made for the filling of temporarily vacant positions during vacations.

In our department, we substitute acting officers for company officers, who are out due to illness, injury or vacation.

A serious manpower depletion caused by illness or injury has not occurred in our department. However, should this happen, our only alternative would be to use off-duty personnel.

J. L. Lodi, Chief, Redwood City, Calif.: In our department, off-shift personnel are assigned to fill all vacancies and paid in cash on an overtime rate of time and a half, in the event of a serious manpower depletion. We do not provide for extra men to be used to maintain company strength, nor do we fill temporarily vacant positions due to illness or vacations.

Off-shift officers are assigned those jobs filled by company officers, when they are out for illness, injury or vacation reasons.

This community has a population of 45,000, with three fire stations, and seven major pieces of apparatus. Our total personnel (51) includes clerks and administrative people. The City of Redwood has an industrial, commercial and residential makeup.

George Daniels, Chief, Roswell, N. Mex.: Our department personnel roster does not provide for extra men to be used to maintain company strength.

THIS MONTH'S QUESTIONS

Does your department personnel roster provide for extra men to be used to maintain company strength at a certain level under all foreseeable conditions? If so, what are your general company manpower levels?

In case of illness to individuals, are the temporarily vacant positions filled by extra men?

Are provisions made for filling temporarily vacant positions during vacations?

How are company officers substituted for during illness, injury or vacation periods?

In the event of serious manpower depletion by illness or injury, do department regulations require that normally off-duty personnel work extra time?

We do not provide for extra men in the event of temporarily vacant positions due to illness nor do we fill vacant positions during vacations.

If there is a need for a company officer at the central station, an officer at the substation would fill in, leaving the substation without an officer.

Although it is not required by departmental regulations, off-duty men would fill in, in the event of a serious manpower shortage.

George Burns, Chief, Anchorage, Alaska: We employ a total department strength of 41 full-paid personnel and do not provide for extra men to maintain company efficiency.

We do not make provisions to fill temporarily vacant positions in our department due to illness, injury, vacation periods, etc.

We substitute company officers by seniority and capability.

We have never experienced a serious manpower depletion but off-duty personnel would fill the need with compensated time granted.

Carl P. Johnson, Chief, Portland, Me.: Our fire department personnel roster does not provide for extra men to be used to maintain company strength at a certain level.

We do not fill temporarily vacant positions due to illness or vacations.

Swing lieutenants are used throughout the department. In the absence of these lieutenants and other company officers because of illness, injury or vacation periods, the senior men on a piece of apparatus is in command.

We've yet to witness a serious depletion of manpower, but if it did arise, normally off-duty personnel would be required to work extra time.

W. A. Westerfield, Chief, Albuquerque, N. M.: Five men ride on all pumpers. This includes an officer, driver and three firemen. Seven men, including an officer, driver and five firemen, ride on the aerials.

Whenever possible, temporarily vacant positions due to illness are filled by extra men. Ten extra men are hired for vacations.

Officers are paid overtime when they substitute for other officers during illness, injury or vacation periods.

In the event of serious manpower depletion by illness, or injury, our department regulations require that off-duty personnel work extra time.

W. K. Blaisdell, Chief, Honolulu, Hawaii: The departmental roster provides for one man in single piece companies and two men in two-piece companies, to maintain company strength. Our manpower levels are: Five men in single-piece companies and nine in two-piece companies.

In case of illness, temporarily vacant positions are not filled, but if two or more men in a company are on sick leave at the same time, a man from another company is sent to augment personnel of that company. Policy is to

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The simplified streamlined design of this precision coupling, which is basically the same as that of your booster hose, guarantees full flow, full pressure and ease of handling under all conditions. Fast emergency hose repairs can also be made in the field if you specify Bar-Way for original application.

Demand Bar-Way reusable couplings on your jacketed hose and watch your efficiency go up and the cost go down.

1 ½" and 2 ½" Conventional Wing Lug in production. All other standard sizes and lug styles available. Special engineering applications on request.

UL **TESTED for 1400 lbs. pressure and 2400 lbs. pull under full pressure.**

BAR-WAY **BAR-WAY MFG. CO., STAMFORD, CONN.**

Write for Bulletin 6600-F

MORE **EFFECTIVE** FIRE PROTECTION

CITY • RURAL • FOREST

MODEL 6600 PUMPER—Instantly Self-Priming—No waiting when seconds count
HIGH PRESSURE—Use one or two hard-hitting streams or fire-blanketing fog-spray
LIGHT WEIGHT—Easily carried to source of water or fire area
NEOPRENE IMPELLERS—Pump dirty water as well as clean water—assure long life
POWER—Efficient 4-cycle, air-cooled 5 HP engine known and serviced world-wide
BY-PASS VALVE, SPRING LOADED GREASE CUP, NO LOSS OF PRIME, PLUS MANY OTHER FEATURES

WEIGHS ONLY 110 LBS.

UP TO 40 GPM AT 150 PSI

MARINE PRODUCTS COMPANY
515 LYCASTE AVENUE • DETROIT 14, MICHIGAN

maintain a minimum of at least four men in single-piece companies and five men in two-piece companies.

No provisions are made for filling temporarily vacant positions during vacations unless an emergency exists when more than one man is out on vacation at the same time. Then, the same procedure applies as stated above.

As substitutes, men up for promotion on the eligible list are used as acting company officers.

The chief of department has discretionary powers to utilize off-duty personnel in maintaining manpower necessary.

Rufus Dorman, Chief, LaGrange, Ga.: In our department, we do not provide for extra men to maintain company strength.

When there are several out on a shift due to illness, off-duty men pull split shifts.

During vacations, we make no provisions for filling the vacant positions.

We substitute company officers during illness, injury and vacation periods as follows: Lieutenants for captains; top truck drivers for lieutenants.

We work 24 hours on duty and 24 hours off and change shifts at 8:00 a.m. When extra work is required, one man works from 8:00 a.m. until 6:00 p.m. and the next man from 6:00 p.m. until 8:00 a.m.

Robert Mills, Chief, Salem, Ore.: In our department, we use extra men to maintain company strength in an emergency only.

No provisions are made to fill temporarily vacant positions due to illness or vacations.

We substitute company officers by appointment.

We would require that off-duty personnel work extra time during an emergency only.

R. G. Harry, Chief, St. Cloud, Minn.: Our department does not provide for extra men to be used to maintain company strength.

In case of illness to individuals, or for vacation periods, we do not fill temporarily vacant positions.

The men in our department are detailed to act as officers, when company officers are out due to illness, etc.

In the event of a serious manpower depletion, we sometimes cancel Kelly days.

We find it very difficult to obtain more men.

Pearly J. Bonnette, Chief, Alexandria, La.: Our departmental roster does not provide for extra men to be used to maintain company strength; we do not have an extra man board.

No provisions are made for filling temporarily vacant positions during vacations or due to illness.

We rotate our officers from one shift to another as the need requires.

Sometimes, when manpower reaches a severe shortage, off-duty personnel work on a time-and-half basis. □□

NOW LOW-COST 2-WAY RADIO

for smaller public and industrial fire departments . . .

For routine or emergency communications in limited coverage areas—install in engines . . . trucks . . . cars . . . jeeps . . planes . . . boats . . . tractors . . . or on desk top at station or control center.

Coordinate operations at scene of fire . . . route and re-direct equipment to areas where needed most . . . reduce accident hazard while traveling to a fire by turning back unwanted units. Vehicles out on routine fire hazard investigations, surveys, grass burning, etc., can be recalled if needed for fire fighting. Gonset 2-way radio makes best possible use of your available personnel and equipment.

SIMPLE TO OPERATE . . . requires no technical knowledge. Just press to talk, release to listen. G-12 can operate on any four 11-meter citizens band channels. Precision, crystal-controlled transmitter/receiver gives positive, stable operation. Noise limiter and adjustable "squelch" provide quiet operation.

DEPENDABLE . . . built for rugged field and industrial service. COMPACT . . . fits easily under dash of vehicle, or on desk top. Built-in power supply permits operation from vehicle battery or power mains.

*WITH MICROPHONE AND TRANSMITTER/RECEIVER CRYSTALS FOR 1 CHANNEL. 149.95

Also available . . G-11 single channel unit. *124.50

Write today for free brochure and booklet, "11 meter Citizens Band Radio"

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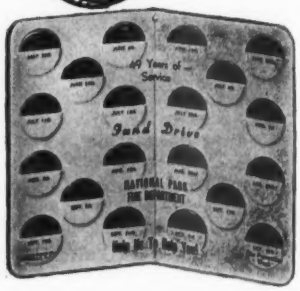

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COIN CARDS

NEW MODERN BUDGET-GIVING SYSTEM!

Donations can now be given on the popular budget system. Donors fill cards with quarters and dimes in dated slots, having them ready for collection at the allotted time. Proven again and again as a successful way to increase donations.

WRITE OR PHONE FOR SAMPLES, DETAILS REGARDING DISTRIBUTION AND PRICES TODAY.

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Obituaries

Chief Michael J. Burke

Michael J. Burke, 49, acting chief of the Jersey City, N. J., Fire Department since February 1, was killed at a fire on April 26, when he fell down an airshaft of a tenement. The three-alarm blaze at 173 Mercer Street involved a row of five-story tenements. Truckmen were performing ventilation when Chief Burke climbed to the roof in an attempt to determine the extent of the fire. Heavy smoke, held down by high humidity, apparently obscured his vision and he stepped into the open shaft.

Chief Burke was appointed to the department on August 1, 1939. He was promoted to captain in 1950, battalion chief in 1953 and deputy chief in 1957. He is survived by his widow and two young children.

Chief Roy Buckland

Roy Buckland, 75, chief of the Belen, N. M., Fire Department, died April 2 following a short illness. He had served 50 years as a volunteer fireman and had been fire chief since 1922.

E. W. Fair

Leon A. Watson, Sr.

Leon A. Watson, Sr., 71, retired general manager, secretary and treasurer of the Fire Insurance Rating Organization of New Jersey died April 2 in Point Pleasant, N. J., Hospital. Prior to his retirement, Mr. Watson had served as a director, National Fire Protection Association and chairman, board of governors, Advisory Engineering Council, National Board of Fire Underwriters.

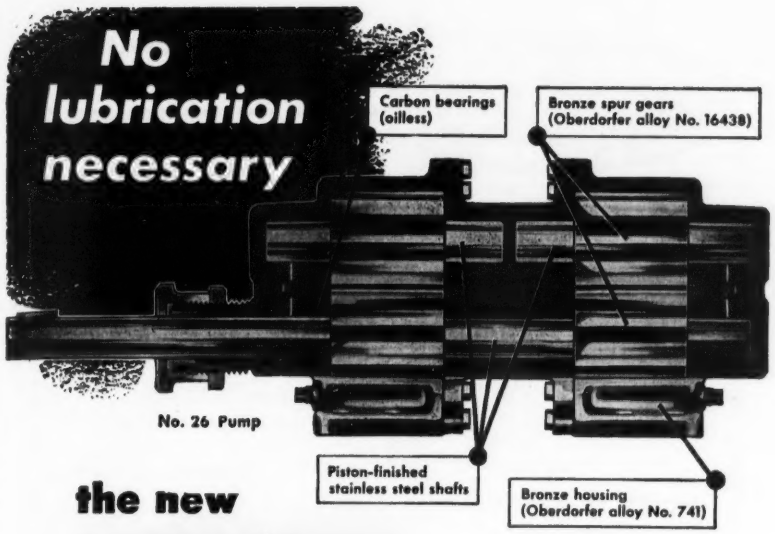
Lawrence N. Clark

Lieutenant Lawrence N. Clark, 54, Newton, Mass., owner of the National Fire Museum in South Carver, collapsed and died while attempting to extinguish a fire near the Edaville Miniature Railroad in South Carver on April 10. Sparks from an engine touched off the blaze in a woods near the museum.

A veteran of 22 years with the Newton department, he was appointed on January 2, 1938, promoted to lieutenant in 1943, and named head of the fire prevention bureau in 1950. A collector of antique fire equipment, Lieutenant Clark also was a builder of exact-scale model replicas of old fire engines.

Harry Sutphen

Harry Sutphen, 65, head of Harry Sutphen Associates, fire fighting equipment company of Columbus, Ohio, died February 3 after a short illness. Shortly after World War I, he joined the 65-year-old


No lubrication necessary
Carbon bearings (oilless)
Bronze spur gears (Oberdorfer alloy No. 16438)
No. 26 Pump
Piston-finished stainless steel shafts
Bronze housing (Oberdorfer alloy No. 741)

the new

OBERDORFER BRONZE BOOSTER PUMPS

These booster pumps with oilless bearings will last 3 to 5 times longer than the old style equipped with plain bronze bearings. As a result of closer machining tolerances, over 20 feet of suction lift may be depended on.

The No. 13 and No. 26 Oberdorfer Pumps are more fool-proof than they have ever been. When you get to a fire you have something you can count on. It isn't necessary to wear pumps out checking them periodically to see if they will work. These pumps are metering pumps in principle and therefore must produce the same volume for every revolution of the drive shaft.

PERFORMANCE DATA—No. 26 and No. 13 PUMPS

Pump No.	Pump Shaft R.P.M.	Pounds Pressure	Hose Length and Size	Dry Suction Lift in Feet	Vol. in Gal. Per Minute
26	1600	120	500'—1½"	20'	150
13	1600	120	500'—1½"	20'	75

LIST PRICES — No. 26 — $249.50 No. 13 — $122.50

Slightly higher west of Rockies

FIRE PUMP DIVISION, Oberdorfer Foundries, Inc., Syracuse, N. Y.

Anyone--Anywhere--Can

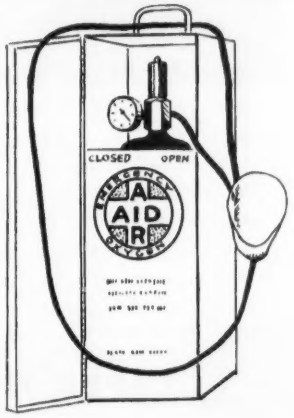
SAVE LIVES

with this low cost—easy to use

only $49.50 *and* 3 for $140.00

EMERGENCY A AID R OXYGEN

The safest, simplest, fastest, most practical, professional and portable FIRST AID EMERGENCY OXYGEN KIT available. Use in heart attack, electric shock, gas, asthma, drowning, etc. 45 minute oxygen supply. Quick acting valve. Easily refilled. Weighs 16 lbs. in 5½ x 24½ sturdy metal case. Extra cylinders available. "WE SELL DIRECT AND YOU SAVE"



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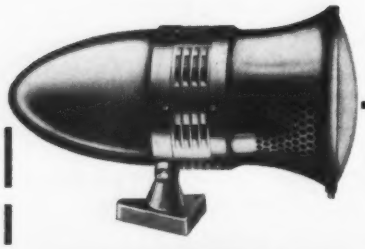

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Siren sounds a penetrating warning, red light automatically flashes authority. Traffic opens instantly, day or night. FREE ROLLING feature.

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- RUGGED
- RELIABLE

Built by proud craftsmen to the highest standards of precision manufacturing . . . utilizing materials of finest quality . . . Sterling Sirens give year-after-year of unsurpassed dependability and satisfaction.

MODEL 20 SIRENLITE
FIRE ALARM SIREN
for Volunteer Systems

Quick acceleration, power-plus . . . Model M really gets the boys out in a hurry! Used by championship companies from coast to coast. A dependable, heavy-duty siren built of the finest materials throughout.

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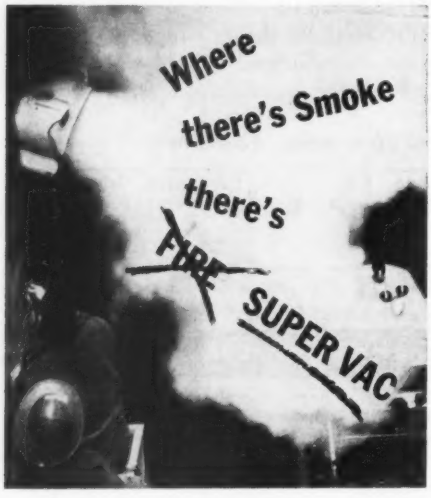

The proven method of complete controlled ventilating and smoke elimination is Super Vac. Fire Department use throughout the U.S.A. and many foreign countries is conclusive proof that Super Vac smoke ejectors do the job — do it right — do it in time. Super Vac smoke ejectors rid area of smoke and fumes by powerful vacuum action as well as reduce dangers of combustion and asphyxiation by forcing a tremendous blast of fresh air into the smoke congested area. Compare these advantages:

- Unique patented perfect spiral air screw — does not *chop* air like ordinary fans.
- No dead spots — creates suction over *entire* face of housing.
- Prolonged motor life — blade forces air *over* motor surface to reduce motor heat.
- Now four sizes — 12" - 16" - 20" - 24".
- AC or DC, regular or explosion-proof motors.
- Running board mounts and hangar unit available.
- Choice of red, white, or metallic green baked enamel finish.

Read the industry standard — our Operational Booklet No. 58, written to firemen by firemen. Contact your fire equipment dealer or write us.

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SUPER VACUUM MANUFACTURING CO., INC.
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company operated by his father and later assumed full command. Under his direction the operation became one of the largest in the country, representing many major fire apparatus and equipment builders as well as manufacturing its own custom fire equipment and providing service in a wide area.

He is survived by his wife, Mrs. Gail Sutphen, two sons, Robert and Thomas, and seven grandchildren. The sons will continue the business under the name of Sutphen's Fire Equipment Co.

Roland B. Duke

Roland B. Duke, first chief of the Leonardtown, Md., Volunteer Fire Department and its president for the past 14 years, died on February 5. Mr. Duke was a past president of the Maryland State Fireman's Association, the first president of the Southern Maryland Volunteer Firemen's Association and the first president of the St. Mary's County Volunteer Firemen's Association. He was mayor of Leonardtown for 20 years and served in the Maryland House of Delegates. □□

Questions and Answers

Piston Vs. Centrifugal Pumps

To the Editor:

I understand a piston pump (volume) can draft water at extreme lengths and will pump sand or gravel without ill effect. Why then are nearly all pumps employed in the fire service of the centrifugal type?

P. B.

Answer: The information we have on piston pumps (volume) indicates they were considered excellent performers but their many disadvantages in comparison with the centrifugal pump caused their steady decline in the fire service until they have all but disappeared.

Large piston pumps are bulky in design and when used for producing large volumes of water pose apparatus mounting and weight distribution problems. They require many moving parts which immediately indicates higher maintenance frequency and increased cost of fabrication.

The pistons fit into cylinders with close tolerance. This design permits positive displacement and results in excellent lift characteristics as long as reasonably clean water is pumped. Contrary to the information you have, sand and gravel will cause definite wear creating increased slippage which immediately reduces the effectiveness.

The centrifugal pump, which is relatively simple in design and construction, overcomes many of these objections and permits much more flexible operation. Fire apparatus pumps are said to be a compromise between cost, size and ef-

ficiency in that order of relative importance. The centrifugal pump more nearly meets these conditions and for that reason, if for no other, has practically taken over the pump field from the piston, and rotary gear pump as well.

Sprinkler Test Connection

To the Editor:

What is the purpose of the inspector's test connection on a wet-pipe sprinkler system?

R. B.

Answer: The test connection has a flow equal to that of a single head. By its use a delicate test of the system alarm is possible. It is recommended that the water flow alarm be tested weekly. An exception to this may be during freezing weather where there is danger of ice forming on the water flow mechanism. A visual and mechanical inspection of the alarm may then insure that all parts move freely (See Handbook of Industrial Loss Prevention, 9-2, Factory Mutual).

Finding Nozzle Diameter

To the Editor:

A recent exam question required that the nozzle diameter be determined. The nozzle pressure and discharge were given. What is the method employed for solving this problem? **F. F.**

Answer: Substitute the given figures in the discharge formula $Q=29.7\ D^2\sqrt{P}$ where Q equals gpm discharged, D equals nozzle diameter, and P equals nozzle pressure.

For example: A nozzle is discharging 250 gpm at 45 psi. What is the diameter?

$$D^2=\frac{250}{29.7\ \sqrt{45}}=\frac{250}{29.7 \times 6.7}=\frac{250}{198.99}$$

$=1.256$

$D=1.256=1.12$, or 1⅛-inch nozzle.

(See "Fire Service Hydraulics," page 40)

Alarm System Types

To the Editor:

What is the essential difference between "Type A" and "Type B" municipal fire alarm telegraph systems?

W. R.

Answer: The type A system requires an operator to check receipt of an alarm from a box and then manually retransmit it to all fire stations or other locations necessary to have knowledge of the alarm. A Type B system automatically retransmits an alarm to fire stations and other locations. It is not necessary for an operator to be present.

According to NBFU Pamphlet No. 73, Type A systems are permissible for any size community or area and are required where the number of alarms and emergency calls, however received, approximate 1,500 per year. Some recently designed Type A systems may include Type B substations and as such are combination systems. □□

From one chief to another...

CHIEF JESSE G. HUNTER, CEDAR RAPIDS, IOWA, SAYS:

"Our Cornelius Compressor satisfies all our needs for compressed air."

MODEL 3800102 — 3000 PSI, 4 CFM. Weight approx. 120 lbs. Unconditionally guaranteed against defects in materials and workmanship for one year.

Chief Hunter reports: "Our Cornelius compressor satisfies all our needs for compressed air for our air breathing masks, both for actual fire fighting duty and for all training purposes. We also take care of our local SCUBA divers' compressed air needs. The source of all our compressed air needs is always available at any time of the day or night with the use of our Cornelius compressor."

Protect your men and inspire their confidence with an abundance of pure, fresh air supplied by a Cornelius compressor. Write today for free literature.

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The world's most reliable automatic protection services against fire, burglary, holdup and other hazards.

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The reputation of this symbol stems from the unmatched efficiency of the organization behind it, the American District Telegraph Company. Superior *service* is responsible for this position of leadership. All ADT systems are regularly inspected, tested and always ready for reliable operation.

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RESCUE KITS

THEY'RE BETTER, FASTER, SURER!

In accident rescue equipment you can't rely on pretty good tools. They must be the *best!* That is why the famous P-F RESCUE KITS get to work *faster* when the need is for life-saving action — *FAST!* Gives you all the necessary attachments for speedy action — backed by the powerful 10-ton Hydraulic Jack in the RK-4 Kit, and the fast 4-ton Jack with the RK-1 Kit.

MAKES PRY-BARS, HACKSAWS, TORCHES LOOK LIKE SLOW-MOTION, IN TIGHT SPOTS

Every P-F RESCUE KIT is easily assembled for every kind of rescue job — no heart-breaking delays! Your men are there, *fast* and *ready* when the call comes. Can you say the same for your present rescue equipment? Better mail the coupon — below.

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the complete story of the P-F RESCUE KITS — how they can speed your rescue operations in free RESCUE KIT Bulletin. Mail the Coupon TODAY!

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Please send me your P-F RESCUE KIT Bulletin — with complete story on Models RK-4 and RK-1.

NAME.....
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BOUND BROOK PLANT

Continued from page 387

fire alarm system of 128 boxes, divided into six areas. When an alarm is sounded, the first numeral of the signal identifies the area of the fire. Those members of the brigade who are nearer the location report there rather than to the fire station. They are trained not to come in empty-handed, but to bring in an extinguisher or stretch a line if they pass a standpipe. The electricians shut off power in the affected area. The two fire trucks approach the fire from different directions. For a building fire, it is standard procedure to stretch a 2½-inch line wyed into two 1½-inch lines and backed up by a 2½-inch line. A 2½-inch line is stretched from the hydrant into the clappered siamese of the pumper.

Extinguishing agents

Depending on the material burning, fog, foam, carbon dioxide or dry chemical is used. Straight streams are never used unless specifically ordered by the fire chief. Fog tends to absorb fumes and to prevent agitation of dust, minimizing the danger of a dust explosion. Dry chemical is effective where cooling is not the primary objective. If the material is above its ignition point, dry chemical will not be too effective and the material will flare up again. Penetrants, such as carbon tetrachloride and wetter water are effective on unbagged phenolic resins.

The plant maintains a rescue squad-ambulance manned by eight men on each shift. These workmen are all active in rescue groups in their own communities and have volunteered for duty with the plant unit during their working hours there. The unit responds to all alarms under the command of a first aid captain and lieutenant who report to the fire chief for orders.

Training

As might be expected in view of Chief Guattery's background, training is stressed at the plastics plant. A fire drill is conducted once a week. Every month each shift of the fire brigade goes through a surprise drill, during which a specific fire problem is presented for on-the-spot solution.

Drills in the training area are made realistic by burning in the test pits "still wash," a potent mixture of various waste flammable liquids. Every brigade member undergoes a two-hour training session each month. He receives his own copy of a brigade training manual and the plant maintains an extensive library of fire fighting and training films. Twice a year a full-scale disaster drill is held. On these occasions, guards set up road blocks at all plant gates, the cafeteria provides coffee and sandwiches for the emergency workers, and facilities are made available for the press, all according to the plan effective in an actual disaster.

Closely allied to training are experiments in new methods of fire fighting to cope with the industry's specific problems. For example, Chief Guattery and Mr. Lynch are testing the efficiency of dry ice to extinguish flammable liquid fires. Cakes of dry ice are eased into 110-gallon tanks of burning "still wash" to lower the temperature and extinguish the fire. Tests are also being conducted with 3 per cent wet water, as a 2 per cent solution has proved ineffective on liquids miscible in water.

Apparatus

The company has two pieces of fire apparatus at the Bound Brook plant. One was especially built by American LaFrance on a G. M. C.

To: Dept. Head or Dept. Foreman (for disposition)
Mail To: Fire Chief

FIRE INSPECTOR'S MEMO
Fire Protection Division
PROCESS SAFETY DEPT.
PLANT 312

Date ..... 19....
Time ..... am pm

Description of condition to be corrected: .....

Location: .....

Signed ..... Countersigned .....
Inspector — Fire Chief

Condition corrected: ..... am pm
Dept. Head — Date — Time

THE ABOVE CONDITION SHOULD BE CORRECTED IMMEDIATELY

Form which inspector serves on discovering an unsafe condition

chassis. It carries 1,000 gallons of foam liquid, and has six 2½-inch outlets at the rear of the rig which will discharge either foam or water. These outlets are supplied from the main pump through a manifold. Because of the special design of the apparatus, it is possible to pump foam from these outlets while the main pump is supplying water lines. The apparatus is equipped with a 750-gpm pump, a hydraulic foam tower and a fixed deluge gun which can discharge a straight stream, fog, water or foam. The hose bed holds 600 feet of 2½-inch hose and 350 feet of 1½-inch.

The other apparatus is a 500-gpm, single-stage, Class B pumper which carries 1,000 gallons of water, 1,000 feet of 2½-inch hose, 350 feet of 1½-inch, and a booster line of 200 feet of 1-inch high-pressure hose.

Both pumpers carry demand-type breathing apparatus, aluminized clothing with pockets built into the back for a mask cylinder so the suits can be used together with self-contained masks.

One truck is radio-equipped and the other is presently being so equipped. Both carry walkie-talkies and voice amplifiers.

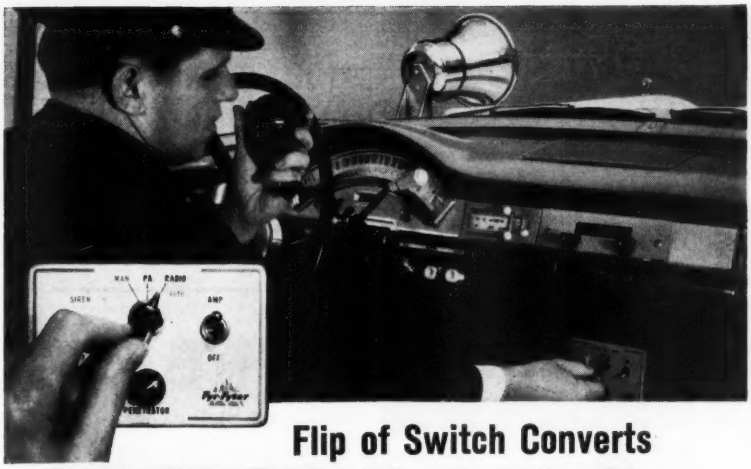
Each apparatus is service-tested at least once a year, and Chief Guattery personally supervises the tests.

Two full-time fire inspectors perform duty according to a schedule drawn up by the fire chief which insures regular inspection of every area of the plant once a week. Each inspector carries a violation order book. If a violation is found, a written order is served on the area supervisor, who is required to acknowledge service by signing the inspector's copy of the violation order. A reinspection is scheduled to check on abatement of the violation. In the case of an extremely hazardous condition, immediate correction is demanded.

The inspectors check on all smoking, burning and welding in the plant. An employee discovered smoking outside of the designated smoking areas is suspended. If burning or welding is necessary, the fire chief issues a permit which stipulates the conditions under which the work is to be done, for example, the number of fire guards to be on duty, asbestos blanket or even a hose line in readiness. The inspector takes an explosimeter reading before the welding or burning is started. The inspectors also check and recharge all of the 1,700 extinguishers in the plant.

Process safety

In addition to the fire inspectors, five full-time process safety inspectors



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PENETRATOR® Electronic Siren

to P.A. Unit or Radio Amplifier!

Penetrator is today's ideal mobile warning and communication system! It compactly combines a powerful 50-watt completely transistorized electronic siren, public address unit and radio amplifier. Penetrator "beams" 90% of sound directly ahead, and to the sides . . . is safer for driver, public, other emergency vehicles! With a flip of switch, Penetrator also serves as a public address system or amplifies incoming radio messages. Other advantages: requires no warmup . . . features override horn relay for low, medium, high or coasting siren pitch . . . operates on low battery drain of 4 amps . . . unaffected by temperature extremes . . . easily installed . . . weatherproof . . . guaranteed. Write for catalog and name of nearest distributor to THE FYR-FYTER COMPANY, 221 Crane St., Dayton 2, Ohio.

Fyr-Fyter

PACIFIC PUMPERS

Standard In Fire Suppression for over 30 years

Pacific manufactures a full line of pumpers, from the light weight 38-lb. model 5A to the larger WX-10 for tank trucks. Also now available, is the new BW model for pumping borate.

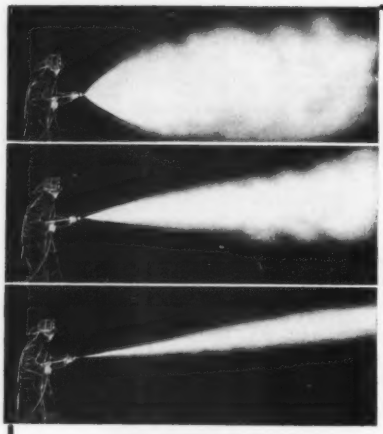
Illustrated, is the WX-10 demonstrating its effective fog spray performance

WX-10 Weight	Pressure	50	100	150	200	225	250
150 lbs.	Gals. per min.	40	38	37	36	35	32

Pacific can supply a complete line of fire suppression equipment from stock including fire hose, extinguishers, nozzles, etc. Write for free catalog.

Pacific Marine Supply Co.

1223 Western Ave., Dept. FE, Seattle 1, Wash.



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STREAM
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- Available in chrome or polished brass
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WATER — WHERE YOU NEED IT!
— WHEN YOU NEED IT!

With the Portable FOL-DA-TANK

This action photo from the Lake Geneva Regional News, Wisconsin, shows the Fol-Da-Tank at work. Water from the tanker is being dumped into the Fol-Da-Tank so that it can return to the nearest water supply for another load thereby assuring a constant supply of water from which to work.

Where the nearest water supply is often miles from the scene of the fire, Fol-Da-Tank acts as a central reservoir from which pumper truck or portable pumps can draft. Readily carried, the Fol-Da-Tank can be set up for use in sixty seconds.

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are employed. Process safety is closely interwoven with fire safety and one complements the other. Process safety primarily provides protection for equipment. As an example, a reaction kettle or "still" in which flammable liquids are processed could pose a hazard because of the possibility of excessive pressure. Process safety is responsible for the testing and inspection of vessels, safety appliances and equipment and is also responsible for conformity with governing codes.

While fire protection and prevention and process safety are stressed at the plant, with the processes and materials involved it is impossible to eliminate all fires. However, every fire, no matter how small, is thoroughly investigated to learn and eliminate the cause. As far as possible, no fire report lists the cause as "unknown." The fire chief, the fire protection engineer and the head of the operating department where a fire occurs collaborate on a "post mortem" after every fire. If one unit of the brigade encounters any serious problem, the fire chief briefs the brigade members on the other shifts to promote the over-all knowledge and efficiency of the entire brigade.

The lack of serious fires is proof that Union Carbide Plastics Company's safety program pays off for management, employees and community. □□

Worst Fire in 26 Years Hits Downtown Elwood

Fire destroyed a quarter block of downtown Elwood, Ind., business area on the night of February 29. The blaze is believed to have started in the basement of a restaurant, and then spread through a common basement to the Local Finance Company.

Icicles hung from some 100 firemen from Elwood and 13 neighboring cities as they battled the blaze through the night while the mercury plunged to a season low of 8 below zero. Veteran fire fighters described it as the worst fire in Elwood in 26 years.

Loss was officially estimated at $228,350. Fire Chief Theodore Wilson is reported to have claimed that the loss might have been less if his department had better equipment. "That 1941 truck we have is just a regular truck chassis with fire equipment mounted on it," the chief declared. "It's not built for fire equipment." Mayor Robert Fortson agreed with Chief Wilson. He said the city "might as well purchase equipment made for fire fighting rather than another makeshift job not suitable for the work."

Chief Wilson credited a solid brick wall with preventing further spread of the fire. "If that wall had fallen, the entire half block would probably have been destroyed," he said. Although firemen suffered nearly frozen hands and feet, there were no injuries. *Arnold Hogan*

FIRE DEPARTMENT MANPOWER

Continued from page 401

upon arrival and directs all fire fighting and life saving activities until relieved of command by a superior officer. Determines and directs the proper deployment of his companies at the scene of a fire. Determines the necessity for additional fire fighting companies at the scene of a fire and notifies the fire dispatcher of such requirements.

Periodically visits each company within the area to inspect personnel, equipment, apparatus, quarters and records. Prepares reports. Supervises the training and drilling of fire fighting personnel. Supervises fire prevention activities in his district. Undertakes and maintains public relations policies of the department. Studies and sets up plans for dealing with possible conflagrations and other emergencies.

Required knowledge, skills and abilities: Thorough knowledge of modern fire fighting and prevention principles, practices and equipment, fire prevention laws, ordinances and regulations, geography of the municipality, safety precautions used in fire fighting, of the rules and regulations of the department and of the laws under which it operates, of the municipality's building code and building conditions and major fire hazards. Good knowledge of fire training practices and techniques, of the location of hydrants and water mains. Ability to recognize fire hazards. Ability to maintain discipline, plan and supervise the work of subordinates, lay out work for subordinates. Ability to adopt quick, effective and reasonable course of action in emergencies, to lead men and give effective orders, to develop a high morale. Ability to prepare technical and administrative reports. Resourcefulness and sound judgment in emergencies. Good physical condition.

Acceptable experience and training: One year of satisfactory permanent service as a fire captain and graduation from a standard senior high school; or any equivalent combination of training and experience sufficient to indicate ability to do the work.

Fire Captain: Has responsible charge of fire companies or a fire station; does related work as required. This is supervisory firemanic work involving responsibility for directing the activities of a fire company. The work is performed in accordance with established policies and requires the exercise of good judgment in emergencies.

Examples of work: Supervises overall fire fighting activities. Checks to insure that men are properly assigned to lay out and connect hose lines and

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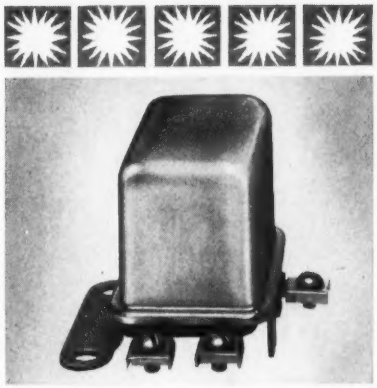

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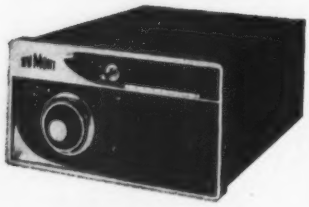

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nozzles, direct hose streams, raise ladders and ventilate buildings. Directs salvage operations during and immediately following a fire. Inspects property at scene of fire to prevent reignition.

Directs the cleaning, checking and replacement of tools and equipment after a fire. Directs custodial and maintenance activities at a station. Inspects equipment, grounds, and station to insure proper order and condition. Inspects building for fire hazards. Maintains discipline. Makes reports of personnel and activities. Directs the maintenance and repair of all hose, nozzles, hydrant gates, fire extinguishers, life net, inhalators. Trains and drills subordinates.

Required knowledge, skills and abilities: Thorough knowledge of modern fire fighting and fire prevention methods. Good knowledge of fire prevention laws and ordinances, of the geography of the area, of first-aid methods, of municipality's building code, rules and regulations and use and maintenance of fire fighting equipment. Ability to recognize fire hazards, maintain discipline, plan and supervise the work of subordinates, lay out work for subordinates. Resourcefulness and good judgment in emergencies. Good physical condition.

Acceptable experience and training: One year of satisfactory permanent service as a fire lieutenant and graduation from a standard senior high school, or any equivalent combination of training and experience sufficient to indicate ability to do the work.

Fire Lieutenant: Supervises activities of a group of fire fighters; does related work as required. The work is performed under direct supervision of a superior officer. A lieutenant has complete charge of operations at scene of fire in absence of or pending arrival of superior officer.

Examples of work: Assigns men to lay out and connect hose lines and nozzles, turn water off and on, raise ladders and ventilate buildings. Responds to all alarms assigned to his company while on duty. Supervises the work of fire fighters at scene of fire and in stations.

Inspects property at scene of fire to prevent reignition. Supervises the cleaning, checking and replacement of tools and equipment after a fire. Inspects equipment, grounds and station to insure proper order and condition. Inspects buildings and premises for fire hazards. Makes reports of personnel and activities. Trains and drills fire fighters. Supervises fire prevention inspections as assigned.

Required knowledge, skills and abilities. Good knowledge of modern fire fighting and fire prevention methods, of fire prevention laws and ordinances, of the geography of the municipality, of first-aid methods and of safety precautions involved in fire fighting. Ability to recognize fire hazards, to get along well with others, to plan and supervise the work of others and to maintain discipline. Resourcefulness, sound judgment. Good physical condition.

Acceptable experience and training: Four years of satisfactory permanent service as a fire fighter and graduation from a standard senior high school, or any equivalent combination of training and experience sufficient to indicate ability to do the work.

Fire Fighter: Performs fire prevention and fire fighting duties, does related work as required. This is standard ized manual work of hazardous nature involving fighting fires and salvage and rescue work under the immediate supervision of superior officers. Routine maintenance and custodial work on station and equipment is performed under general supervision and inspected upon completion.

Examples of work: Responds to alarms and emergency calls with fire company. Lays and connects hose lines and nozzles, turns water on and off. Holds fire hose and directs stream. Puts up and climbs ladders, and enters burning buildings when necessary. Makes openings in burning buildings for ventilation and entrance.

Removes persons from burning buildings. Performs salvage operations at scene of fire. Learns and practices new methods. Drives and operates motor-driven fire fighting equipment. Performs miscellaneous clerical work when assigned. Assists in giving emergency first-aid treatment to injured persons. Cleans and maintains fire fighting equipment. Performs a variety of tasks in connection with the maintenance and repair of buildings and grounds. Performs fire prevention inspections.

Required knowledge, skills and abilities: Mental alertness, mechanical aptitude. Ability to get along well with others. Willingness to perform any task assigned. Conscientiousness and dependability. Excellent physical condition.

Acceptable experience and training: Graduation from a standard senior high school, or any equivalent combination of experience and training sufficient to indicate ability to do the work.

Special requirements: Age—21-25; height, weight and physical condition —in accordance with adopted standards. Possession of a valid motor vehicle operator's license at time of permanent appointment. □□

PORTLAND IMPROVEMENTS

Continued from page 388

can be activated from fire alarm headquarters. The doors automatically close three minutes after opening and a horn gives a 20-second warning before this action occurs.

The closing device includes an "electric eye" positioned to preclude accidental closing on any object which might remain in its path. In addition to conserving heat by closing the door, the electronic controls extinguish station lights and shut off the electric range. The apparatus floor is equipped with drive-through doors in the rear of the station.

Since passage of the $3,000,000 bond levy, 13 pieces of new apparatus have been purchased and delivered, including seven 1,250-gpm triple combination pumpers, four 85-foot aerial trucks and two 100-foot aerial trucks.

The new apparatus are all powered by the 315-hp engines with five-speed synchro-mesh transmissions. They are equipped with electric sanders for braking and traction on slippery streets, and in addition, apparatus assigned to hill areas have "no-spin"-type differentials.

The new pumpers are equipped with high-pressure booster pumps and carry 300 gallons of water. All are "cab-forward" design with seats for five men. Each is equipped with 100-ampere alternators, wired for "plug-in" cords to supply floodlights or other electrical equipment directly from the vehicle engine.

The two 100-foot aerials are of the tractor-drawn type, while the 85-foot aerials are of four-wheel design. Each has a two-way intercommunication system from the top of the ladder to the base on the turntable. A dependable safety belt which permits maximum freedom of movement is provided for the man who operates a monitor nozzle from the top of the aerial ladder. Hydraulic rescue kits, smoke ejectors with explosion-proof motors of 5,000-cfm capacity and portable 1,500-watt generators are carried.

Uncompleted phases

Construction has been started on three additional fire stations with completion scheduled for this summer. Two are combination land and boat stations whose companies will respond either with a fireboat, or a fire pumper, as the alarm operator directs. It is believed this concept of a combination land and water company will afford a fuller utilization of manpower. The new stations will be better located along the high-value port and dock

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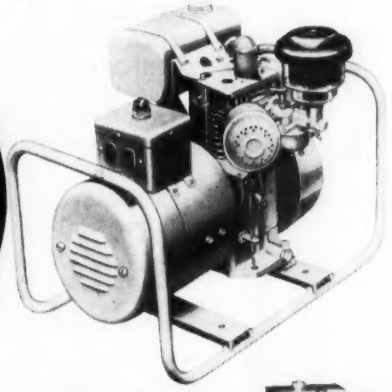

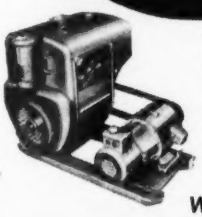

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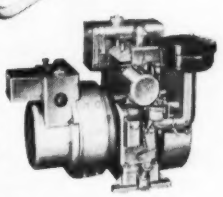

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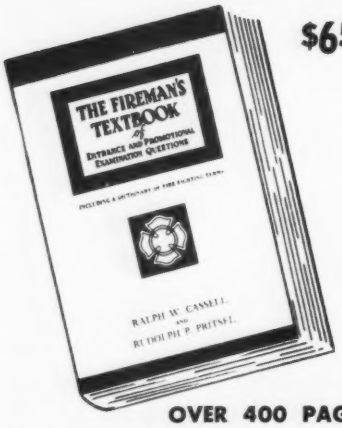

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area and will establish the three fire boats more nearly equidistant along Portland's busy waterfront.

One prime multiple-company station situated in the southwest commercial and apartment house area will have to be relocated to make room for the South Auditorium Urban Renewal project. A new site cannot be obtained until the west side freeway interconnection has been finalized. In addition, a site in the south central East Side is being delayed because of negotiating difficulties. This would be a key installation for a double fire company, district chief's quarters, drill and training school, and shops for fire bureau carpenters, painters and plumbers.

Additional fire apparatus is still to be purchased, including an immediate order for three 750-gpm pumpers. Also, there are plans for one additional manifold truck to operate in conjunction with a pumper in the high-value district. Two modern hose trucks that have recently been released from service because of fire company consolidations, will be rebuilt into 500-gallon tank wagons with booster pumps. Specifications are now being prepared to call for bids for the complete repowering of all three fireboats with full conversion to diesel fuel.

Final planning and decisions have been made on Portland's fire alarm system and construction will get under way in the immediate future. It is estimated that this project will require two or more years to complete. In addition, other existing fire stations are due for remodeling in the near future, with first priority for those housing new fire alarm substations. □□

HOTEL FIRE

Continued from page 398

100-foot aerial; Valley Stream, one 100-foot aerial and one 1,000 gpm pumper; Hewlett, one pumper, and Lawrence-Cedarhurst, two more pumpers.

Early in the battle against the blaze, at 9:19 a.m., a request was transmitted for an increase in the city water pressure. When the firemen were ordered out of the building, portable deluge sets were put in operation surrounding the hotel. This required water to be relayed to the south and east sides of the building. At least one of the hydrants nearest the hotel was on a dead-end main, and water pressure continued to be a problem.

Principally to obtain help with the long relay stretches needed, a call for mutual aid from New York City was sent through Nassau County Coordi-

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nator Peter Lynch at 11:18 a.m. This was the first call for help under a mutual aid agreement between the New York Fire Department and the Nassau County Fire Commission, which became effective January 1, 1960. A similar mutual aid pact between New York and Westchester County, became effective March 7, 1960.

The New York City dispatcher transmitted Box 700 D, one of three dummy boxes, which actually designate rendezvous points for companies responding on mutual aid calls to Nassau County. The assembly point in this case was the quarters of Engine 314 in Rosedale. The five engine companies designated to respond were supplied with necessary fittings for operating in Nassau County and, with a battalion chief in command of the convoy, were escorted to Atlantic Beach by Nassau County police. Fire Commissioner Edward F. Cavanagh, Jr., and Chief of Department George David of New York also responded.

Two of the New York companies operated portable turret pipes on the fire while the other three companies relayed water to them. Shortly after he arrived on the scene, Chief David ordered a second alarm transmitted for the special box, bringing five more engine companies to the fire. All of these units hooked up to more distant hydrants and relayed water to the companies closer to the blaze.

Despite the efforts of the various Nassau departments and the mutual aid from New York City, the initial handicap of the inadequate water pressure could not be surmounted, and the hotel was gutted.

Editor's Note: The editors are grateful to Fire Chief Jess Mistero of the Inwood Fire Dept. for information on which this article is based. As first deputy chief, he worked at the fire, and was recently elected chief.

FIRE-RESISTANT AIR FILTERS

Continued from page 397

glass and now asbestos separators. Dozens of adhesives have been studied, and the best presently available is still combustible, but a self-extinguishing additive has made the adhesive relatively acceptable. Frames of wood, plywood, various metals, and even asbestos have been field-tested. The best to date is plywood impregnated with a fire-retardant material.

One important function of the filters is providing a flame barrier to prevent further fire spread. This is provided by a separator, which must retain position and conformity under

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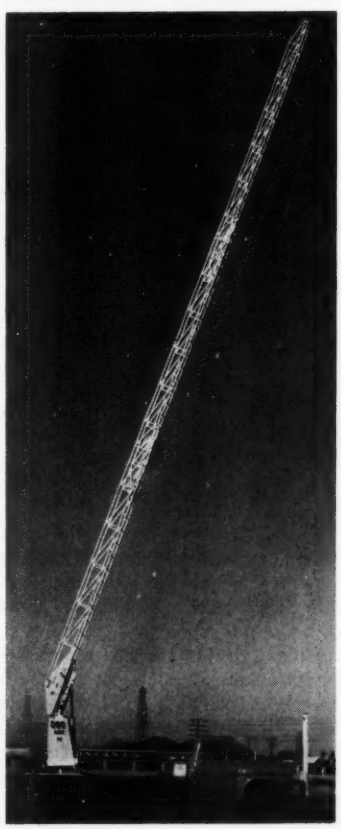

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exposure. The illustrations show that they do this to a remarkable degree.

The tests conducted at Hanford were quite severe as accompaning pictures show. The remarkable thing about the filters is that they withstood the tests as well as they did.

In addition to burning tests, the filters were exposed to moisture and flow characteristics tests in which the filters were subjected to various degrees of and up to 100 per cent saturation.

Throughout the tests, the goal was to develop a fire-safe filter with the same high efficiency as was obtained with the original Chemical Warfare Service filter. It was expected that the new filter would be more expensive, but when the first major purchase was made in 1957, the units cost about 10 per cent less than the competitive combustible units.

Many uses should be found for this filter in the future including atomic bomb shelters, and containment programs for power reactors, as well as for medical, chemical, aviation, automotive, optical, and many other types of industries where increasingly safer and better air filtration is needed.

Even with the present high efficiency and the good fire characteristics of this filter, further research is continuing at Hanford toward obtaining a more perfect filter. □□

FIRE-RETARDANT PAINT

Continued from page 390

The unpainted control specimens had a weight loss of 58 per cent after six months exposure outdoors and reached an asymptote of 50 per cent weight loss after two years exposure outdoors. After eight years exposure the fire tube weight loss on the painted specimens was only 22 per cent and reached 27 per cent after 10 years exposure. Even after 10 years exposure outdoors, the painted fire tube sticks had sufficient protection to meet normal control tests of Underwriters' Laboratories inspection. Plates I and II relate the fire tube weight losses to the various exposure periods.

The fire tube test used in this work, while not considered to be of sufficient scope to be used for rating purposes, is recognized to be a valuable laboratory tool for determining quality of treatment or loss of fire retardance. Temperatures measured at the top of the tube reach 800° C. in four minutes when untreated wood is tested. On the other hand, the average maximum temperature at the top of the fire tube on painted specimens tested after five years outdoor exposure was 227° C.

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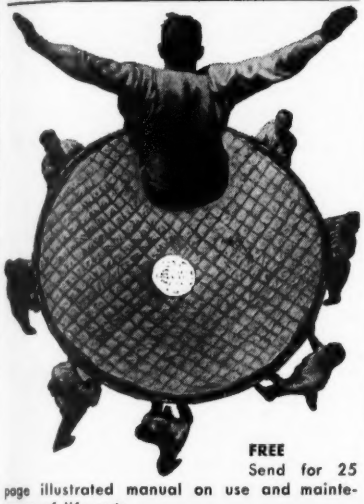

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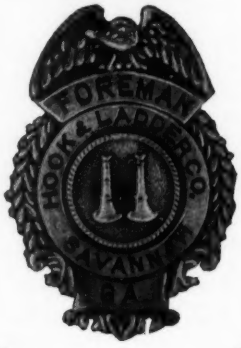

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After 10 years exposure, the temperature was only 234° C.

It is of interest to note that no additional paint was applied during the 10 years of exposure even though severe weathering and peeling had taken place. (Figure III). This indicates that the major protection to the treatment was given primarily by the paint vehicle, resins, oils, etc., which formed a sealer at and just below the surfaces of the wood.

In view of the results obtained in this test, it is obvious that fire-retardant treated wood could be used out of doors if a paint film is applied, and given normal maintenance. However, fire-retardant treated wood is recommended for use only in buildings under cover.

SCHOOL FIRE DRILLS

Continued from page 399

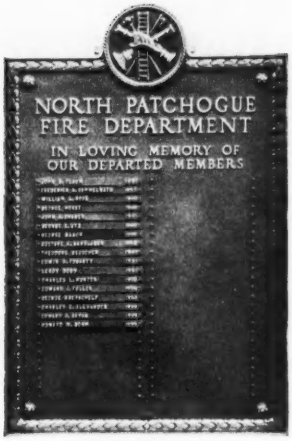
most needed, at the beginning of the school term. Also, cold weather is less of a problem during these periods.

7. *Blocked exit drills.* In order to give practice in devising different escape routes, the normally used exits and stairs should be blocked off just before the drill.

8. *Toilets, first-aid rooms, dressing rooms, etc.* Monitors should be designated to see that these special areas are searched to make sure no one is overlooked (monitors for such tasks should be teachers, custodian, nurse).

9. *Auditoriums in use—changing of classes.* Most fire drill organization plans are designed so as to have the children back in their home rooms, in charge of their regular teacher, at the time of the drill. Under these conditions, evacuation of schools is, as a rule, gratifyingly swift. *But* what if an actual fire occurs at other times, such as while the auditorium is filled or during the change of classes in upper grade schools? In the latter case, hundreds of students are in transit away from regular teacher guidance and control. Suppose the alarm bell rings at this point? Will the fire drill progress just as smoothly and rapidly? If it is the average school, then it will not. A good fire drill organization plan must include these contingencies!

10. *Who turns in the alarm?* Many persons (teachers are no different) are reluctant to take positive action for fear they may be wrong. The principal of a school may have an unwritten understanding that he or she should be notified before an alarm is transmitted for fire. In some cases, teachers are not



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sure how to activate the mechanism. None of these conditions, if they exist, should be tolerated. There should be a clearly defined policy that in case of any suspicion of fire, the alarm should be turned in immediately by any responsible person. If the alarm turns out to have been unnecessary, there should be no recriminations.

11. *Teacher training.* All school personnel should be trained, as part of the drill organization plan, in how to transmit alarms, how to differentiate between and use the various extinguishers and the location of fire blankets in domestic science rooms and chemistry labs. Teachers should instruct their students, the older ones particularly, in the location and use of these safety devices. Teachers should assign their students to the various positions dictated by the drill plan, such as who closes the windows, who holds the doors open for pupils to pass through and then closes the doors after them, who checks to see if the room is emptied. All teachers should carry a roster of all children under their jurisdiction so that a roll call can be conducted as soon as the class has evacuated the school.

12. *Custodian.* He must keep fire escapes and courtyards paths free of snow and ice. He should frequently check the operation of fire escape drop ladders. At times, the hook supporting the ladder is attached the wrong way which would prevent the ladder from sliding all the way down to street level.

13. *Shelter areas away from school.* In the event of an actual fire, provisions should be made to shelter the chil-

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dren in inclement weather. It may be a considerable time until arrangements can be made to get them home. Occasionally, as part of the regular fire drill, students must be removed from the school vicinity in orderly and controlled fashion, so as not to interfere with operations if a fire took place. This also would protect the children from danger of falling debris, sparks, explosions and collapsing walls. In busier areas, plans must include provisions for stopping traffic so that children can cross streets safely.

14. *Records of performances.* Accurate records of performance and timing should be kept so that comparisons can be made with previous drills. This will show any progress, reveal any defects in the plan and show areas needing improvement. Discussions among the school administrative officials, teachers and fire department inspecting officers centering about these records are invaluable as a means of improving procedures.

15. *Conclusion.* Remember, when in doubt, there are two things you can do which more than anything else will insure the safety of children in the school: SOUND THE FIRE ALARM BELL—CALL THE FIRE DEPARTMENT. □□

Navy Honored for Fire Prevention Activities

The Grand Award plaque, denoting the winner of the Military Division, U. S. Navy, 1959 Fire Prevention Contest sponsored by the National Fire Protection Association, was presented the U. S. Naval Station, Norfolk, Va., on March 17 by Percy Bugbee, general manager, NFPA. Rear Admiral G. R. Donaho, U. S. N., Assistant Chief of Naval Operations and director, Naval Administration, accepted the award on behalf of the Navy. In addition to the grand award, 28 certificates of merit were presented to 26 Naval and two Marine Corps shore activities.

O. J. Emory

Admiral Donaho (left) accepting award plaque from Percy Bugbee in recent Pentagon ceremony

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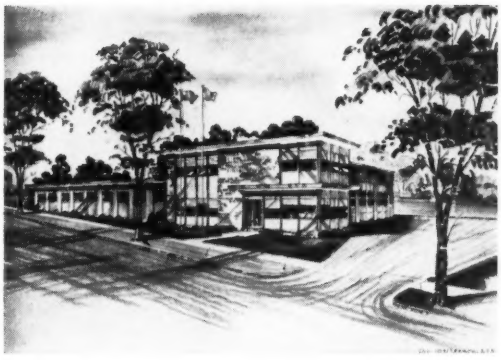

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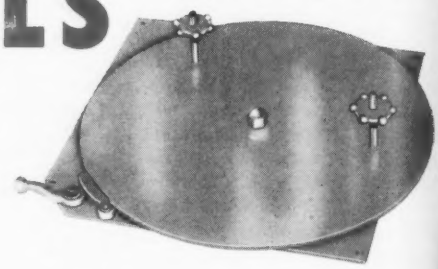

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Style 503A

Style 501-MT
3-Inlet

Style 500-MT
4-Inlet

Style 491
2-Inlet

Style	Wt. Lbs.	Hgt.	Stacked Tips	Threads				
				Inlets	Discharge Pipe	Base Tip	Middle Tip	Top Tip
491	55	42″	1¼″, 1½″, 1¾″	2½″	2½″ NST	2½″ NST	Underwriters'	1½″ NST

Style	No. of Inlets	Wt. Lbs.	Hgt.	Stacked Tips	Threads				
					Inlets	Discharge Pipe	Base Tip	Middle Tip	Top Tip
501-MT	3	78	51½″	1½″, 1¾″, 2″	2½″	3½″ SIPT	2½″ NST	2″ Chicago Hose	Underwriters
500-MT	4	80	52″	"	"	"	"	"	"

Style	Length	Width	Height	Weight Lbs.	Material	Finish
503	27″	16¼″	16″	27½	Malleable Iron	Red
503A	27″	16¼″	17″	28	Malleable Iron	Red

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